Farm Structure, Industry Structure and Socioeconomic Conditions: An Analysis of U.S. Counties

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Introduction

The effects of the economy on social structure have concerned classical as well as contemporary sociologists. Studies of the relationship between economy and social structure in developed societies, however, have tended to focus on the nonfarm industrial rather than the farm sector (e.g., O'Connor, 1973; Bell, 1973; Galbraith, 1968; Wright, 1978). Moreover, the two sectors tend to be treated in virtual isolation of each other. Empirical studies have rarely been aimed at assessing the joint impacts of farming and industry structure. On a more general, theoretical level, sociologists have also neglected to examine the larger social forces commonly shaping both farming and industry (Newby and Buttel, 1980).

The purpose of this study is to address the previous gaps in the literature by (1) discussing the uneven development of farming and industry, which has resulted in their differentiated structures and (2) examining the effects of both farm and industry structure on socioeconomic conditions.

Differentiation in Industry and Farm Structure

Industry Structure

The tendency toward the concentration and centralization of capital has been widely observed in the industrial sector by researchers from various theoretical orientations (Galbraith, 1968; Chandler, 1977; Wright, 1978; Edwards, 1979; Braverman, 1974). Industrial sociologists have argued that the transition to advanced capitalism has resulted in two district types of privatized economic sectors, with their respective firms (Averitt, 1968; O'Connor, 1973; Edwards, 1979; Burawoy, 1983). One is the peripheral (competitive) sector. The other is the core (oligopoly and monopoly) sector. A third sector, representing production organized by the state, is interrelated with these privatized sectors. Firm expansion and market concentration have

produced an economic system whereby large firms come to dominate the most profitable industrial sectors, while smaller, generally more recently established firms compete among themselves in competitive markets. Such economic segmentation is broadly recognized in the industrial sociology literature (Averitt (1968); O'Connor (1973); Baron and Beilby (1980); Hodson (1983); Hodson and Kaufman (1982); Edwards (1979); Jacobs (1985); Devine (1984,1985). However, the extent that a firm resembles a core or peripheral enterprise or the extent that an industry is composed of such firms are empirical and often disputed questions (Hodson and Kaufman, 1982; Hodson, 1984).

According to economic segmentation theory, core firms are large-scale and have a major share of the production in their home industries, operating in sectors with limited competition. These firms also tend to be vertically integrated, have geographically dispersed plants, and have diversified product lines. Compared to noncore firms, profits in core firms tend to be higher, while risks of failure are lower. Core firms tend to employ workers who are better paid, higher skilled, and disproportionately male, white workers. Core firms have a number of advantages over peripheral (noncore) firms that facilitate their growth: they can better capture economies of scale; they have greater access to credit since their probability of long-term survival is greater; and they can benefit from competition among peripheral firms who compete for the services and contracts they offer (Jacobs, 1985:168-169; Swanson, 1982:300). Edwards (1979) has provided empirical documentation of the growth of these core firms.

In contrast to the few hundred core firms with enormous market power, almost 12 million small and medium-sized firms exist in the competitive sector,

in industries or branches of industries not yet controlled by corporations (Edwards, 1979:72). Edwards terms present-day peripheral firms, the "small-fry counterparts" of nineteenth century competitive capitalism. According to Edwards (1979:72) these firms confront many competing sellers in their home product markets, while facing "great monopoly power everywhere else." Thus, peripheral firms may only be able to sell to a few firms (as in the case of auto parts suppliers); they may use products available only from a few manufacturers (as in the case of food franchises); or they may depend on larger enterprises for financing, for granting subcontracts, or for retailing their products (Edwards, 1979:72-73). In comparison to core firms, peripheral firms tend to have smaller, lower paid labor forces, and less intensive and more informally organized divisions of labor. They tend to experience higher failure rates and lower profit rates. Further, they tend to employ those who can be paid at lower rates, such as women, blacks, and youth (Edwards, 1979: 73-74; Jacobs, 1985:167-179; Baron and Beilby, 1980:752).

In addition to the organization of production in two privatized sectors or those organized by capital, production is also organized by the state (O'Connor, 1973; Hodson, 1978, 1983; Tolbert, 1983; Devine, 1985; Baron and Beilby, 1984). Devine (1985:152) summarizes the recent industrial sociological literature on the role of the state in the economy:

> On the one hand, the state must insure the viability of the market and buttress private accumulation. As such, state policies must be supportive of the demands and distributive claims of capital. On the other hand, the state is simultaneously responsible for maintaining societal legitimation. Hence, the state must ameliorate some of the inequities and politically destabilizing outcomes of the market and maintain an adequate degree of social cohesion...

Schervish (1983:17) maintains that the state functions as part of the business sector, in that it produces an array of goods and services, such as education,

health, and legal services, and constructing and providing recreational facilities. As part of the business sector, the state further acts as an employer. The state also functions to mediate economic relationships and thereby serves a conduit for the accumulation process: it intervenes in the privatized economy by providing money and in-kind transfers, by formulating monetary policy, and by providing subsidies, regulations, and labor legislation (Hodson, 1983:17).

The organization of economic production has thus undergone a process of uneven development, which has led to the emergence of three conceptually distinct economic sectors. The process of uneven development is observable in geographic space as well. From a geographic and historical standpoint, most capitalist enterprises, particularly those in the core sector, have been located in cities and in frostbelt areas. Under capitalism, there is a tendency for uneven development to occur as capitalists try to minimize the costs of assembling factors of production and to maximize profits. The proximity and availability of production factors--supply of means of production, labor power, and infrastructure--coupled with access to ready markets initially attracted enterprises to centralized locations in cities (Harvey, 1975:9). Moreover, firms in cities can often draw resources from hinterlands, which may further depress these areas and exacerbate uneven development. According to Harvey (1975:16), the general tendency for capitalism is expansion: this can occur as an intensification of relationships in the centers of capitalism and as "...a geographical extension of those relationships in space...where, when, and exactly how these intensifications and geographical extensions will occur...are a matter for concrete historical analyses."

As historical conditions have changed, U.S. firms have expanded or relocated outside metropolitan areas. For several decades, there has been shift of people, jobs, and investment capital from central cities to the suburbs, from older industrial metropolitan areas in frostbelt states to southern and southwestern states, and from all regions in the U.S. to foreign nations (Squires, 1982:63; Summers et al. 1976:7-14). Bluestone (1982) contends that a juncture of three conditions have led to the relocation of firms and to firm closings since the early 1970's. According to Bluestone (1982:51): (1) international competition has undermined the profits and investment strategies of U.S. firms; (2) post-war labor victories constrained management's ability to respond to changing demands in the national and international economy; and (3) changes in transportation and communication allowed capital to become dispersed to different areas. As a result of these three conditions, firms began to close down plants and to search for more profitable investments in formally less desirable locations. Many plant closings have been in manufacturing, usually considered a major provider of "core" jobs. Bluestone and Harrison (1980:20) found that in the United States between 1967 and 1976, 1,501,000 manufacturing jobs were lost, while only 936,000 were gained, a net loss of over one-half million jobs. Hodson (1978:473) contends that job openings have now shifted to the marginally competitive and state sectors.

Nonfarm Industry and Farming

The tendency toward market concentration and increasing firm size has also been observed in the farm sector. However, farming has not changed as rapidly nor experienced the same qualitative changes as industry. The growth of

capitalist enterprises has proceeded more slowly. Simple commodity production still typifies much of the farm sector.

The differences between the nature of farm and nonfarm production processes account for the slower development of capitalism in farming. In comparison to industry, farming presents barriers to the penetration of capital (Rodefeld, 1974:123-126; Mann and Dickinson, 1978; Swanson, 1982:51-53; Goss et al., 1980:92-93). The biological nature of farming reduces its attractiveness to capitalist investment. Biological transformations have greater vulnerability to changes in production than the physical transformations engendered by industry (Pfeffer, 1983:542; Swanson, 1982:52-53). Biological transformations are difficult to halt in midproduction, should productions conditions become unfavorable. The effects of natural conditions such as poor weather, pests, and blights also increase the vulnerability of farming (Swanson, 1983:53). Such risks tend to make farming a more unattractive investment than nonfarm industry.

A further difference, also related to the biological nature of farming, is that in farming, unlike most other industries, there is a major disjuncture between labor time (the amount of time active labor is required) and production time (the amount of time capital is tied up in production) (Mann and Dickinson, 1978:471-473; Pfeffer, 1982:737). Due to the seasonality of farming, production cycles are discontinuous and involve waiting stages alternated with stages of heavy labor input. The disjuncture between production and labor time results in: lower profits (because capital is turned over less frequently, being tied up in production); infrequent realization of profits, generally only at harvest time; and problems of labor recruitment. On balance, Mann and Dickinson (1978) argue that most farm production is unattractive to capitalist

investment, except for those commodities where production and labor time more closely coincide. Changes in technology and in the organization of production have facilitated the growth of capitalist enterprises in commodities such as cotton, lettuce, and tomatoes (Friedland et al., 1981). Simple commodity production remains in those commodities where production time greatly exceeds labor time, particularly in annual crop and livestock production (Mann and Dickinson, 1978:471-473).

In contrast, the development of nonfarm agricultural enterprises or agribusiness proceeded similarly as other industry. The tendency for increasing or concentrated amounts of capital to become centralized in fewer corporations has been widely observed (Goss et al., 1980; Hamm, 1979; Friedland et al., 1981). Capitalist investment has most rapidly penetrated those areas of agricultural production not directly involving farming: the provision of agricultural inputs; and the processing, transportation, and marketing of farm products.

Farm Structure

Stockdale (1982:322) succinctly summarizes many of the empirical observations on farm change:

> It has been suggested that we are moving toward a bifurcated or dualistic farm system. One part of it is composed of a large number of small, part-time, subsistence, retirement, and hobby farms that provide a pool of surplus labor in rural places. The other is a smaller number of large, highly capitalized, farms that generate profits for agribusiness firms and financial interests by purchasing large volumes of production inputs and prodicing relatively inexpensive agricultural commodities.

While most farm enterprises are closer to simple commodity than to capitalist units, it is also clear that family farming has undergone a process of differentiation. This term, according to Buttel (1980b:20), "...refers to the tendency in a market economy for some family farmers to be differentially

efficient and productive, to have unequal access to inherited wealth...and to be unequally able to accumulate profits." In the process of differentiation, some producers have been transformed, or have undergone degrees of qualitative changes such that they may no longer approximate simple commodity producers. For example, some producers may combine farming with off-farm employment; others may undergo transformation to capitalist production; others may not survive in farming and hence, leave farming for wage labor.

The work of Kautsky (Banaji, 1980) is important in describing the transformations experienced by producers. Kautsky (Banaji, 1980) argued that the farm sector was inextricably related to other economic sectors. As the economy expands, nonfarm capital comes to penetrate the farm sector. Family labor farmers undergo a process of differentiation, whereby some farmers come to increasingly resemble wage-laborers and other, large-scale, capitalist producers. Farmers first become dependent on off-farm sources for inputs, markets for outputs, and for subsistence goods. Because of this market dependence, farmers also tend to specialize in those commodities which will bring the highest prices.

As the farm sector becomes transformed by market forces, large holdings gain increasing advantages over smaller holdings. Such advantages result from economies of scale in land, labor, and technology, cost advantages in marketing outputs and in purchasing inputs, and in easier access to credit. As holdings become centralized and as technology develops, smaller family farms fail to absorb available household labor. If no supplementary off-farm employment is available, Kautsky argued that these producers' level of subsistence would decline. They would be forced to limit family size or to migrate to other areas. As industry entered rural areas, however, smaller producers would

rapidly seek off-farm employment. Such producers would be on a path away from farming, either engaging in part-time farming or selling off holdings to become solely industrially employed. Kautsky (Banaji, 1980:70) noted that holdings become more rapidly fragmented where employment opportunities exist outside farming.

Kautsky thus argues that independent producers become increasingly differentiated or internally stratified due to the penetration of off-farm capital into the farm sector. This internal stratification is reflected in the decline of traditional family farming, and in the growth of large farms, and smaller, often part-time farms. The internal stratification of the farm sector takes place along the lines of major production factors. Farming becomes characterized by both the concentration of and fragmentation of holdings; by units which have both little and extensive need for labor; and by units that are increasingly linked to the nonfarm sector for operating capital or household reproduction. Thus, from Kautsky's work, one can argue that producers should not be homogeneous, simple commodity or capitalist producers, but should occupy an array of internally stratified positions.

In examining farm structure, most previous literature refers to three general, but conceptually distinct farm types: traditional family farming or simple commodity production, where land, labor, management, and capital are provided largely by the family and the farm occupies most available household labor; smaller-than-family farms, which do not occupy most available labor and which would characterize part-time operations; and large-scale industrial farming or capitalist farming, in which land, labor, management, and capital are provided by different, unrelated individuals. Rodefeld's (1974,1978) work has provided a basis for such farm structure classifications.

Rodefeld considers the farm system of production which employs four basic factors of production--land, labor, management, and labor. Rodefeld argues that farm organization can be explained by examining who exercises control over each of these factors. He states that control over these factors is reflected in five basic status-roles which the farmer and/or the farm household may occupy: landowner, capital owner, organizational and operational manager, and laborer. The extent to which the farmer or household performs each of these roles determines the level of differentiation in farm organization. The level of differentiation thus indicates to which extent ownership, labor, and management functions have been transferred to off-farm entities. For example, an undifferentiated farm structure would exist where an operator or household provided more than 50 percent of each of these functions. Such a farm structure would typify the traditional family labor farm.

Rodefeld (1978) develops four major farm types using this conceptualization by contrasting ownership (of land and capital) with the amount of labor provided by the farm's operational manager or his/her household. The traditional family farm is largely undifferentiated; larger-than-family farm structure occurs where hired labor replaces family labor, but ownership and management is still family based; tenant farming occurs where labor and management are family based, but ownership is not; finally, industrial farms are operated by a resident manager but owned and worked by generally non-family members.

Rodefeld (1978, Table 8:174) adapted the 1959 and 1964 Census of Agriculture to typology in order to examine changes in agricultural structure. It should be noted, however, that this adaptation tended to overestimate the number and sales of both family and larger than family farms. Over the two

time periods, the number of family farms, tenant farms, and larger than family farms decreased by 11.9 percent, 27.7 percent, and 12.2 percent, respectively, while the number of industrial farms increased by 23.1 percent. As a percentage of all farm sales, both family farms and tenant farms declined slightly, while sales by larger-than-family farms and industrial farms increased slightly. Rodefeld's (1978:175) findings suggest a decline in family and tenant farms, relative to larger-than-family and industrial farms. Rodefeld (1978, Table 2:166) presents longer-term evidence of the increasing differentiation in farming by categorizing all farms from 1910 to 1964 based on the proportion of acres owned by the operational manager. The number and total acreage of full-owner farms declined throughout this period. Part-owner farms (from one to ninety-nine percent ownership) increased in number and acres; while hired manager-tenant farms increased in acres but decreased in numbers. Thus, full-owner farms have tended to decline as farm structure becomes increasingly differentiated.

One shortcoming of Rodefeld's analysis of the organizational changes in farm structure is that his typology does not permit the examination of some farm types, such as part-time farming. Much of the literature on farm change has also tended to focus on certain types of farming, particularly family labor and industrial farming. Comparatively less attention has been directed to the opposite end of the continuum: smaller than family farms or farms that do not occupy all available family labor (Stockdale, 1980:322).

Kautsky's framework coincides with Rodefeld's and similar categorizations of farm structure if we conceptualize farms as empirically approaching any one of the three dimensions in farming. That is, by assuming some producers approximate smaller than family farms; some are closer to simple commodity

production (approximate the family type); and some are closer to capitalist enterprises (approximate industrial farming). While acknowledging a variety of farm types, this study will examine farms that approach each of the three farm types. These farm types will be referred to as smaller family, family (or larger family), and industrial-like corporate farms.

In sum, farming and industry have undergone uneven development resulting in differentiated structures. The industrial sector has come to be characterized by privatized and state enterprises employing wage labor. Farming has become differentiated into units reflecting a range of adjustments made by family operators--from units which do not occupy all available household labor to units highly dependent upon wage labor. The following section examines the impacts of these farm and industry structures on socioeconomic conditions.

Farm Structure and Socioeconomic Status

The Goldschmidt Hypothesis

The work of Walter Goldschmidt has been a starting point for studies which have examined the effects of farming on socioeconomic structure and well-being. Goldschmidt (1968) performed a case-study of two rural communities in the San Joaquin Valley which differed on farm scale. He selected Arvin as the community dominated by large farms and Dinuba as the family farming community, but argued that the two communities were fairly similar on other control variables.

Goldschmidt found varying socioeconomic differences between the two communities which he attributed to farm scale. An important difference involved the stratification structure (1968:346). In Arvin, 64.5 percent of major household-income earners were farm laborers, compared to 29.1 percent in Dinuba. Farmers and white-collar workers made up only 19.4 percent of the major household-income earners in Arvin but 51.3 percent in Dinuba. Estimated

median income of those employed was somewhat higher in Dinuba, $2350 as compared to $2100 for Arvin. Differences were also noted in sustenance, living conditions, government decision making, social participation, and retail trade.

Goldschmidt (1968:308) maintained that "the reported differences in the communities may properly be assigned confidently and overwhelmingly to the scale of farming factor." According to Goldschmidt (1968:308), small-scale farming produced a community of middle-class individuals, with a high stability in income and tenure, and "...a strong economic and social interest in their community. Differences in wealth among them are not great, and the people generally associate in those organizations which serve the community." In the large farm community, however, relatively few people have economic stability and welath, with large numbers "whose only tie to the community is their uncertain and relatively low-income jobs" (Goldschmidt, 1968:308).

Further Studies: Extensions of the Goldschmidt Hypothesis

Since the seminal work of Goldschmidt, a number of studies have examined the relationship between farm structure and socioeconomic well-being. While such studies have employed various conceptual frameworks, regional locations, methods of data collection, and methods of analysis, they share certain commonalities: studies in the tradition of Goldschmidt examine the effects of farm structure on community stratification and/or on other types of socio-economic well-being. The studies generally hypothesize that large-scale, industrial farming, dependent upon hired labor will have a detrimental impact, while smaller scale, particularly family labor farming, will enhance community life. These studies date from approximately the time of Goldschmidt's Arvin and Dinuba study to the present. In addition to studies examining the impact of large, industrial farms as opposed to family farming, a few studies have

also examined the impact of different aspects of farm structure on well-being. Both types of studies have been reviewed and are summarized in the previous section.

The studies do not offer unequivocal support for the Goldschmidt hypothesis that large scale, industrialized farming has negative consequences for social well-being. However, overall, the studies present much empirical evidence in support of Goldschmidt. In summarizing the findings of the previous literature, two remarks are in order.

First, the purpose of most studies is to examine the impact of indicators of one or both farm concepts--farm scale and organizational characteristics--on social well-being. Farm scale is generally considered in terms of sales or acreage. Organizational characteristics are usually conceptualized as the extent of off-farm dependence on production factors, such as land, labor, and capital. Nearly all studies examine indicators of scale. Organization is examined less frequently.

Second, in examining relationships between farm scale/organization and socioeconomic well-being, most studies take a linear approach: they hypothesize that the larger the farm size or the greater the organizational dependence on off-farm inputs, particularly labor, the more negative the impact on socioeconomic well-being (Tweeten, 1981; Swanson and Skees, 1985). As a consequence, researchers have tended to present findings which contrast small and medium sized farms and/or farms dependent on family supplied production factors with larger farms and/or industrialized-type farms, dependent upon hired labor. While a few studies consider other aspects of the farm/well-being relationship, such as the impact of part-time and contract farming, these will be considered separately. With the above limitations, in mind, the

studies point to a generally consistent relationship. Large-scale farms and/or those dependent upon hired labor appeared to reduce social well-being, while smaller farms employing little hired labor appeared to enhance social well-being. The studies found negative impacts of large-scale and/or hired labor farming (and concomitant positive impacts of smaller, particularly family labor farming) in the following areas:

(1) a decline in or smaller local population (Goldschmidt, 1968; Heady and Sonka, 1974; Rodefeld, 1974; Wheelock, 1979; Swanson, 1980).

(2) lower incomes for certain segments of the population, such as hired laborers, increases in income inequality, or increases in poverty (Tetreau, 1940; Goldschmidt, 1968; Heady and Sonka, 1974; Rodefeld, 1974; Flora et al., 1977; Wheelock, 1979).

(3) lower levels of living (Goldschmidt, 1968; Rodefeld, 1974).

(4) lower numbers or quality of community services (Tetreau, 1940; Goldschmidt, 1968; Raup, 1974; Fujimoto, 1977; Swanson, 1980).

(5) less democratic political participation (Tetreau, 1940; Raup, 1973; Goldschmidt, 1968; Rodefeld, 1974).

(6) lower community social participation and integration, greater social-psychological problems for hired farm workers (Goldschmidt, 1968; Heffernan, 1972; Rodefeld, 1974; Martinson et al., 1976; Poole, 1981).

(7) decreased retail trade and fewer, less diverse retail outlets (Goldschmidt, 1968; Heady and Sonka, 1974; Rodefeld, 1974; Fujimoto, 1977; Marousek, 1979; Swanson, 1980; Skees and Swanson, 1985).

(8) environmental pollution, depletion of energy resources (Tetreau, 1940; Raup, 1973; Buttel and Larson, 1979).

(9) greater unemployment (Marousek, 1979).

Further, in accordance with Goldschmidt, the previous studies tended to observe that farm scale and organization impact upon the stratification system: local society reflects the statuses imposed by the economic system. Thus, an agricultural system of large-scale farms which are dependent upon hired labor, as opposed to family labor farming, produces a local social

structure composed mainly of hired workers (assuming local agricultural dependence). Studies which examined the relationship between farm scale and farm social structure found farm scale positively related to the extent of hired farm labor (Flora et al., 1977; Goldschmidt, 1978b; Harris and Gilbert, 1982). Smith's (1969) analysis also suggests but does not directly test this relationship. Further, a number of the studies found links between farm scale and/or organization and the socioeconomic structure of the locality examined (Tetreau, 1940; Goldschmidt, 1968; Rodefeld, 1974; Flora et al., 1977; Wheelock, 1979).

While overall the previous studies suggest support for Goldschmidt, there have been a number of divergent findings. The impact of large scale farming on quality of life has been found to vary. Heaton and Brown's (1982) findings indicated that large farms conserve more energy per dollar value of agricultural products sold and have lower rates of increase in energy usage. Skees and Swanson (1985) found increases in farm scale related to increases in property taxes, indicating the availability of greater public revenue for community services in large farm areas. Harris and Gilbert (1982) found the total effects of large farms on rural income to be moderately positive. Eberts (1979b) found average market value of agricultural products sold, which can be considered a measure of scale, positively related to indicators of county well-being. Wheelock (1979) found that counties with relatively larger farms in 1960 had growth in population, median income, and income distribution in the 1970s, suggesting that negative consequences of rapid farm change (also found in the study) may be offset by other community factors. Swanson (1982) similarly argued that off-farm factors could mediate potential detrimental effects of large farms. Finding little relationship between population decline

and growth in farm scale over a thirty year period, he notes that communities tend to become less agriculturally dependent over time such that nonfarm factors, particularly off-farm employment opportunities, play a greater part in determining community well-being. According to Swanson, greater off-farm farm employment probably stabilized potential population losses due to the decrease in farm numbers and increase in scale.

Two studies found specific costs and benefits associated with both large and small farms. Heady and Sonka (1974) noted that while smaller farms have positive socioeconomic effects for farmers and their communities, they lead to higher food costs for communities. Marousek (1979) found a trade-off between smaller and larger farms: small farms provide greater employment, while large farms produce greater area income.

The relationship between socioeconomic status and community well-being, as hypothesized by Goldschmidt, has also been shown to vary. Flora et al. (1977) found that although industrial type agriculture contributed to the decline of proprietorship and growth of wage labor in the retail sector, counties having a higher wage labor to proprietor ratio had greater growth in median family income. This contrasts with Goldschmidt's observations that a community with higher wage labor should have lower socioeconomic well-being. Green (1985) also found that socioeconomic structure, as measured by the percent of county wage earners and the percent of farms operated by owners were not important predictors of county quality of life.

According to Skees and Swanson (1985), studies in the Goldschmidt tradition may require reconceptualization. They note that such studies possibly misspecify the relationship between farm scale and well-being by examining only linear rather than curvilinear relationships. Skees and Swanson's (1985)

argument is supported by their finding that counties with either smaller or very large average farm scales were more likely to have high levels of unemployment.

Finally, studies that extend the analysis of farm and socioeconomic relationships by examining more recent farm types which vary from the traditional family farm ideal, such as contract farming and part-time farming, have generally not found negative community impacts. Heffernan et al. (1981) examined the impact of part-time farming on local communities. They found few differences between part-time and full-time farmers regarding their perceived attachment to community social activities, their reasons for living in rural areas and their perception of community-related objectives. Skees and Swanson (1985) found part-time farming tended to be associated with higher levels of living. Heffernan (1982b:340) notes that although few studies have examined vertical integration, "the little research that has been done finds little alteration in the quality of life in rural communities that can be attributed to a trend toward vertical integration." Heffernan's (1972) study supports this contention. He found few differences between family farmers and integrated broiler growers with regard to involvement in community activities. Ebert's (1979) findings, however, do not indicate that contract farming enhances community life. Eberts (1979) examined the effects of poultry farming, a major type of contract farming. He found negative and/or insignificant correlations with poultry farming and measures of community viability.

The conclusions of studies examining the impact of farm structure on socioeconomic structure are summarized by Heffernan (1982b:340-341). After a brief review of previous literature on this topic, he states:

> ...all relevant research to date suggests that a corporate type of agriculture results in a reduction in the quality of life for at least some people, especially the hired workers in rural communities. No single study or set of studies can answer all of the research questions, but it seems significant that a dozen studies, spanning four decades and all regions of the nation, and performed by different researchers using different methodologies, have rather consistently shown that a change toward corporate agriculture produces social consequences that reduce the quality of life in rural communities.

While Heffernan is correct that most studies until 1982 supported Goldschmidt, more recent findings (e.g., Harris and Gilbert, 1982; Green, 1985; Skees and Swanson, 1985) have been mixed. One of the purposes of this study is to contribute to the debate on the Goldschmidt hypothesis by further testing the relationship between farm structure and socioeconomic conditions.

The Impact of Industry Structure on Socioeconomic Status

The impact of industry on socioeconomic status has been examined by a variety of studies. These studies have considered the effects of industry, in general, for individuals in specific geographic areas; the effects of different types of industry for workers; and most recently, the effects of types of industries for individuals by the geographic area in which they live.

Research that has examined the impact of incoming industry has found costs and benefits for individuals and their localities. Summers et al. (1976) reviewed 186 studies of manufacturing plants located outside Standard Metropolitan Statistical Areas (SMSAs). These studies were concerned with the impact of plants when they moved to these local areas and were conducted between 1945 and 1973. The predominant types of industries examined were metal production and fabrication, chemicals, and clothing. Plants ranged in size from less than ten to over four thousand workers.

Summers et al. (1976:62-71) provide summary information on changes in

income for a number of localities having incoming manufacturing. They (1976:62) state that the anticipated effects of such industries are that they:

> will increase the demand for labor, both through direct employment and the stimulation of other sectors of the local economy, which will reduce unemployment and underemployment. These changes will, in turn, tend to increase the average income among the communities residents. For the most part, available date tend to support the assumption that development will result in an increase over time in average income (for both individuals and families), but...these findings should not be accepted uncritically for the purposes of policy-making.

Summers et al. (1976) found that increases in community per capita income (for 28 localities) ranged from 5.3% to 183%, but in more than half the localities the increase was under 50%. For median family income (for 20 localities), increases ranged from 25.6% to 178%, but with a third of the localities having changes under 50%. Summers et al. (1976) note that the largest increases were in those communities with the lowest per capita and median family incomes. Though Summers et al. (1976) do not directly examine industrial segmentation, they also state that the smallest increases in income tend to involve low-wage industries, such as wood, textiles, and apparel. In regard to the distribution of income after incoming industry, Summers et al. (1976:69) state that little research has been aimed at this area. They do note, however, that some groups tend to benefit more than others: one study reported a negative effect on the relative income status of the elderly; another study involving four Southern nonmetropolitan areas concluded that blacks benefited less than whites.

Shaffer (1979:104) in a review of studies on nonmetropolitan industrialization, likewise argues that impacts on individuals' tend to be highly variable. He cites three case studies examining effects on income. One study documented the impact of 33 manufacturing establishments on Appalachian communities; 53% of those who were already employed at the time they gained their present job stated they had an earnings increase, while 12% had a decline

in earnings. Another study reported that for 110 Texans employed at a new plant, 17% held jobs at wages equal to their previous employment; 20% experienced income decreases; while the balance (63%) had wage increases. Finally, 39% of household heads migrating into rural Ozark areas for manufacturing jobs had income losses, with most family incomes, as a result, dropping below poverty. Shaffer (1979) states this latter study should be viewed cautiously, since many of the sample were return migrants, presumably returning for noneconomic motives, and that cost of living changes were not considered in the calculation of poverty. Finally, Shaffer (1979) states that while added payroll is generally considered the major impact of new incoming plants, this may not contribute to other business in the host community. For example, in a study of 11 Ohio plants, only 21% of the annual payroll was reported spent in the community.

Other studies have examined the effects of industry on individuals in specific areas. Skees and Swanson (1985) found the percent employed in manufacturing negatively related to median family income for counties in the South. Horan and Tolbert (1984) found a dimension of employment reflecting high wage manufacturing positively related to earnings and median income for 51 southern labor markets (defined by county groups). An urban trade dimension, reflecting core industry types was also positively related to earnings and median income and negatively related to income inequality.

In sum, a number of studies have examined the impact of nonfarm industry upon individuals in various locales. While not aimed at examining qualitative differences between industries, the previous literature does provide some indication that certain types of industry may have different impacts on localities. In the economic segmentation literature, however, distinctions

among industries are crucial to assessing the impact these have upon socio-economic structure and well-being. One of the major outcomes of the segmented economy is lower earnings for workers. Hodson (1983) examined data on 20,007 private employees from the 1973 Current Population Survey. He found that workers classified as periphery had about twice the likelihood of falling below the poverty level than core workers. Similarly, in subsamples of workers, Hodson found that employees of core sectors received substantially higher earnings than employees of the periphery. Beck, Horan, and Tolbert (1978) classified industries as core and peripheral and grouped a sample of 1683 individuals from National Opinion Research Center data into these categories. They found that employees in the two sectors exhibited significant differences in regard to earnings levels. Hodson (1978) examined average earned income by economic sector. For 1973, averaged earned income for employees classified as core sector was $8548. Peripheral sector workers averaged $5196, while state sector workers fell between these two levels. According to Hodson (1978:437) state-sector wages should be "relatively high because of the political clout of organized state employees, who are more highly organized into employees associations and unions than are workers in the competitive sector." As compared to the monopoly sector, however, state sector wages should not be as high "because the state cannot grant such wages in the face of low productivity per worker and taxpayer resistance."

Economic segmentation in industries has also been found to have impacts for those in the localities where such industries are present. Tomaskovic-Devey (1985a) examined 100 SMSAs for 1979-1980. He operationalized the core sector as those employed in durable manufacturing, utilities, communication, and construction. He found that core industry was significantly related to

higher mean earnings for workers and lower labor force poverty rate. Working through these two variables, core industry structure had an indirect negative impact on SMSA poverty rates. Service employment, generally considered peripheral employment, however, had no significant impact on poverty.

Others have relatedly argued that industry quality should affect individuals in localities. McGranahan (1980:316) states that where the labor market is tight, "high-wage manufacturing not only affects incomes for those employed in these plants but also induces an area wage 'roll out,' which drives up wages in the rest of the local economy." As a result, McGranahan (1980:316) notes, localities with greater high wage manufacturing, should have a higher and more equal income distribution. Finally, Howes and Markusen (1981:451) argue that low wage manufacturing industries, many of which move to the South, are a new source of the area's poverty.

In sum, the literature indicates that nonfarm industrial sectors have an impact upon the people and places in which they are located. Moreover, economic segmentation research has found that industries vary in their effects on employees: core and state industries have a relatively positive impact upon earnings, while peripheral employment is low-wage, even poverty level. Recent literature has also argued that the impact of industry type should be visible for individuals in the localities where such industry is present.

The Hypothesized Relationships

From the previous empirical and theoretical research, the following processes are important in understanding the relationships among farm, industry, and socioeconomic status. First, both farm and industrial structure have undergone great changes, particularly within recent years. These changes are a consequence of the dynamics of capitalist development and of specific histor-

ical conditions. Economic sectors have tended to develop unevenly. Farming has become differentiated, with a decline in family labor farming, and concomitant growth in smaller farms and large-scale industrial-like farms. In industry, economic segmentation has occurred, whereby industry has come to be composed of three distinct sectors: core, peripheral and state. A de-industrialization process has also occurred: employment seems to have declined in core manufacturing sectors and increased in the state and periphery; firms have relocated to more rural areas, to the South, and to foreign countries.

Second, most analysts, from the classical sociologists onward, have observed that economic structures affect socioeconomic structure and well-being. Economic structure is reflected in class structure, and hence, in individuals' income and other forms of well-being. A variety of studies over several decades have found negative impacts of hired-labor dependent industrial farming on economic and social well-being, with concomitant positive impacts of family farming. This literature has generally observed an inverse relationship between farm scale and well-being, although there have been contrary arguments that such relationships may actually be curvilinear, with negative impacts of very small farms. The literature in industrial sociology on the segmentated economy has also described the consequences of working in the core, the state and the periphery for workers. In addition, industry structure has been viewed as impacting both the people and places where it is located.

From the previous literature several hypotheses may be developed. Following Goldschmidt, we hypothesize that smaller-scale farm units not dependent upon hired labor (termed smaller family and larger family farming) will lead to higher socioeconomic conditions, while the converse is hypothesized for industrial like hired labor dependent corporate farming. It is also

expected that core and state industries will contribute to higher socioeconomic conditions, while the converse is expected for peripheral industries.

Data and Methods

The changes in farming, industry, and socioeconomic status addressed in this study are a result of broad, historical trends in the United States. Because such trends are national in scope, as well as historical, it is appropriate for this study to employ longitudinal data encompassing the entire United States. Data at the community level would be useful in testing those hypotheses which were derived from Goldschmidt's study. However, the data required to test these, as well as the other hypotheses outlined in the study are not available for most U.S. communities, particularly over time. Since data at the county level are available for the entire United States and for multiple time periods, such data will be used to test the hypotheses.

Two time points, 1970 and 1980 are examined in this study. The availability of data was an important consideration in the selection of the two time points. County industry and agricultural data are available after 1980, but the major source of social indicators, the Census of Population, was conducted in 1980. Other indicators, such as poverty level, were reported in the Census of Population only after 1960. Data items from secondary sources also tended to be more comparable for the 1970-1980 period than between these and earlier years.

This study has a major focus on farming. As a consequence, the selection of counties to be included in the analysis was based upon those counties for which farming, as defined by the Census of Agriculture, was reported. The Censuses of Agriculture have generally reported data for all counties with ten or more farms. The Censuses which most closely correspond to the time periods

in this study were conducted in 1969 and in 1978. A total of 3046 counties had farming data for both years. Other modifications due to the availability of Census of Population data further reduced the number of counties to 3037.[1]

Farms Structure

The measurement of farm structure has been problematic for researchers. This seems to result both from a lack of appropriate data and from the conceptual impreciseness with which farm structure may be defined. First, the major secondary source for data on farm units, the Census of Agriculture, published by the Department of Agriculture, does not readily conform to the socioeconomic and, particularly the noneconomic, categories needed for sociological measurement of farm structure (Buttel, 1983a:90). Further, there has been a tendency to conflate concepts such as scale and organization (e.g. tenure and labor requirements) in defining farm structure. Studies have frequently used farm scale to characterize farm structure, with the implicit assumption that measures of scale also reflect measures of organization. Indicators of single concepts, such as scale, are thus employed to develop multiple indicator measures which could tap the more complex dimensions of farm structure (Wimberley, 1985:53).

The work of Kautsky (Banaji, 1980) provides the conceptual referent for measuring farm structure in this study. Kautsky argued that farm structure was tied to the dynamics of nonfarm sectors. As economic development occurs, the farm sector undergoes a process of differentiation. Producers formerly independent from market factors come to use purchased inputs and produce commodities for sale in markets and thus become vulnerable to market changes. In order to stay in farming, producers must develop work routines and techniques which allow available resources to be employed in producing profitable

commodities with minimal risk (Perry, 1982:671). Simple commodity producers or family labor farmers become rapidly differentiated as they attempt to adapt to market changes and are transformed into marginal or capitalist producers. Differentiation in farming becomes evident along the lines of major production factors, land, labor, and capital. The structure of farming becomes dualistic, characterized by the presence of: both concentrated and fragmented holdings; units having extensive or minimal labor requirements; and units which are linked to the nonfarm sector for operating capital or for household reproduction.

Kautsky's conceptual perspective coupled with empirical observations of U.S. agriculture, give this study a basis for assessing the specific lines along which farm structural differentiation may be occurring. Differentiation may be said to occur: in the organization of farm production, such as land and capital ownership, management of farm operations, and labor inputs; and in farm scale. In addition, operator/household characteristics may reflect demographic and off-farm work adjustments made as the nonfarm market economy penetrates farming. Differentiation along the above lines would seem to characterize the bifurcated structure of U.S. farming.

In order to operationalize farm structure, measures which would reflect the dynamics of differentiation were needed. These measures also had to have the county as a geographical referrent and had to be comparable over time. Wimberley (1983a, 1984, 1985) has developed measures of farm structure which describe differentiation on a number of indicators at the county level. Thus, unlike most previous measures of farm structure, Wimberley's measures are not single indicator items; each measure is composed of several items which indicate the patterns or dimensions of farm structure in a given county.

Moreover, these measures have been constructed for four time points: 1969, 1974, 1978, and 1982. Wimberley's (1983a, 1984, 1985) work forms the basis for measurement of farm structure in this study. These measures are reproduced for the 3037 counties and for 1969 and 1978.

Following Wimberley (1983a, 1984, 1985), Census of Agriculture data are used to operationalize farm structure. Twenty indicators which are comparable for both the 1969 and 1978 Censuses are employed. These are essentially the same indicators analyzed in Wimberley's research on farm structure. The indicators reflect major areas of county farm differentiation and are briefly described in Appendix A.

Factor analysis is employed to determine the dimensions of farm structure. First, the dimensions of farm structure are extracted by a principal axis factor analysis. For both 1969 and 1978, criteria used to determine the number of factors which account for the common variance among the indicators, such as the scree test, proportions of estimated variance explained, and the sizes of the eigenvalues for the unrotated factors, revealed a three factor solution.

Oblique, promax rotations which allow for the determination of factor structure without imposing orthogonality among factors, were then performed. This produced a three factor pattern for 1969 and for 1978 with similar magnitudes of rotated loadings of variables on the same factors for both years. This indicated that the factor pattern for 1969 was similar to that found in 1978; hence, farm structure could be delineated by the same indicators. Wimberley has further found essentially the same factor pattern among the variables for 1974 and 1982 as well. The loadings of the variables on each factor for 1969 and 1978 are presented in Tables 1 and 2. Variables with the

Table 1. Three Oblique Dimensions of 1969 Agricultural Structure for 3037 U.S. Counties*

	County Level Indicators	I. Corporate/ Commercial Agriculture	II. Larger Family Farm Agriculture	III. Smaller Family Farm Agriculture
1.	No. of farms	.01240	.36242	.75278
2.	% land in farms	-.18872	.79400	-.17870
3.	Mean farm size	.05829	.03802	-.25427
4.	Small farms (< $2500 gross)	-.09902	-.36011	1.10215
5.	Gross sales	.76618	.30429	-.08470
6.	Farm real estate value	.69141	.34543	-.03836
7.	Individual family	.05174	.72907	.32263
8.	Partnership	.11776	.74054	.20689
9.	Corporate	.89767	-.14439	.00732
10.	Full-owner	.04782	-.01477	.95913
11.	Part-owner	-.07094	.78359	.26318
12.	Tenant	.02157	.82196	.01279
13.	Farm resident	-.06306	.44302	.70546
14.	Age	.06615	-.77844	.38684
15.	Off-farm work	.07759	-.15645	.98070
16.	Farms with hired workers	.16098	.38162	.59960
17.	No. of hired workers	.79525	-.09301	.18564
18.	Contract labor expenses	1.00152	-.31467	-.02986
19.	Customwork expenses	.84053	.20975	-.14655
20.	Machine/equipment value	.24840	.75651	0.5754

* Underlined items indicate variables used in the structural index for each dimension.

Table 2. Three Oblique Dimensions of 1978 Agricultural Structure for 3037 U.S. Counties*

	County Level Indicators	I. Corporate/ Commercial Agriculture	II. Larger Family Farm Agriculture	III. Smaller Family Farm Agriculture
1.	No. of farms	.02283	.34405	.76281
2.	% land in farms	-.10846	.81804	-.23279
3.	Mean farm size	.10018	.04605	-.30218
4.	Small farms (< $2500 gross)	.01724	-.49626	1.07785
5.	Gross sales	.76326	.30608	-.07212
6.	Farm real estate value	.53128	.55479	-.03804
7.	Individual family	-.05831	.57591	.59238
8.	Partnership	.21423	.52273	.38219
9.	Corporate	.78878	.05642	.02665
10.	Full-owner	.09315	-.04246	.94790
11.	Part-owner	-.14909	.74394	.39722
12.	Tenant	.06666	.82142	.04036
13.	Farm resident	-.04534	.38642	.74616
14.	Age	.09334	-.76413	.26171
15.	Off-farm work	.00782	-.14330	1.01756
16.	Farms with hired workers	.21524	.33702	.58355
17.	No. of hired workers	.84287	-.13098	.16866
18.	Contract labor expenses	1.02616	-.30110	-.03164
19.	Customwork expenses	.93853	.08760	-.14593
20.	Machine/equipment value	.28011	.77292	.02290

* Underlined items indicate variables used in the structural index for each dimension.

highest loadings on each factor, those greater than .70, are used to define each factor and to provide the basis for index construction. The three patterns of county farm structure emerging for 1969 and 1978 are explained in the following pages.

Factor I. Variables that load highly on this factor reflect a county farm structure organized along corporate lines. Farm labor requirements, as indicated by the number of hired workers and expenses for contract labor are high. This farm structure is also somewhat capital intensive, with high expenses for custom work, and machine hire and rental incurred by county farms. As would be expected, this pattern of county farm structure produces high gross sales, and hence can be considered large scale in terms of sales. However, in terms of farm acreage, it appears scale neutral, with low loadings on mean farm acreage. This dimension reflects many of the characteristics attributed in the literature to industrial-type farming. Wimberley (1983a, 1984, 1985) terms this dimension, and this study does likewise, as the "corporate/commercial" pattern of county farm structure.

Factor II. Variables which load highly on the second factor indicate an organizational pattern of part-ownership and tenant operations, owned independently or in partnerships. This farm structure characterizes those counties with much of their land in farming. Loadings for agricultural sales on this factor, though moderate as compared to the corporate/commercial factor, indicate that this farm structure generates a substantial amount of farm production. There is high investment in farm machinery and equipment and somewhat high real estate values (particularly in 1978) for farm land and buildings. This farming pattern tends to be more capital intensive and uses little hired or contract labor. In terms of operator characteristics, the

negative loading of age on this factor indicates that operators in the county are younger. Wimberley (1984:4) surmises that "counties containing these farms may tend to have second generation operators who...could be in partnership with the preceding generation and who often rent or lease some of the land they farm." Thus, while not strictly family labor farming (as defined by operator control and ownership over major production factors), this farm structure represents many of the characteristics of family farming. In regard to the differentiation process described by Kautsky, this farm structure seems to describe those simple commodity producers who are not marginalized in the course of development, but rather who become increasingly market orientated in the attempt to stay in farming. This factor will be referred to as the "larger family farm pattern" of county farm structure.

Factor III. Finally, the third factor describes a pattern of county farming with many small farms or those having less than $2500 in annual sales. Loadings on mean farm size are moderately negative, indicating that county farms have small acreages as well. These counties contain many individually or family owned farms and operators with on-farm residence. An important characteristic of counties with this farming pattern is that they have many part-time operators who work off-farm for most of the year (200 or more days). This pattern of county farm structure thus seems to reflect the differentiation of family labor producers into marginalized farmers via off-farm labor opportunities. Following Wimberley, this dimension is referred to as the "smaller family farm" pattern of county farm structure.

In order to create the indexes of farm structure, variables with the highest loadings (analagous to standardized regression coefficients) or those over .7, were selected to represent each dimension. Moreover, the variables

selected had to have high loadings for both 1969 and 1978 so that comparable indicators could be developed. A further criterion was that they be consistent with the same measures developed by Wimberley for other time points; this was to ensure that the dimensions remained stable measures of farm structure over time.

The indicators of the corporate/commercial pattern that met the above criteria are: (5) total dollar value of agricultural sales in the county, (9) number of corporate farms in a county, (17) the number of hired farm workers in the county, (18) expenses for contract labor incurred by county farms, and (19) expenses for custom work, machine hire, and rental of machinery and equipment.

Indicators selected to represent the larger family farm pattern are: (2) the proportion of a county's land in farming, (11) number of county farms operated by part-owners, (12) number of farms operated by tenants, (20) the estimated market value of farm machinery and equipment. While mean operator age also loaded highly on this dimension for 1969 and 1978, it has not been employed, because lower loadings at other time points on this factor indicated it was not a stable indicator.

Finally, the small family farm pattern was operationalized by (1) the total number of farms in a county, (4) the number of small farms, (10) the number of full-owner operated farms, (13) farm residency, (15) the number of operators working 200 or more days off-farm.

In order to create the indexes, each variable was standardized to a mean of 50, standard deviation of 10. Because the variables were all in different metrics, this allowed them to be equally weighed. The variables for each dimension were then summed. Finally, because each index was based upon a different number of variables, each index was standardized to a mean of 50 and

standard deviation of 10. This permits comparison across all three dimensions. While it would have been desirable to generate factor score indices which would reflect the weights of a variable's loading on each factor, this was not possible. The highly intercorrelated nature of the variables resulted in a singular correlation matrix which attenuated the scoring coefficients. However, the indexes constructed from the above variables had intercorrelations which were close to the intercorrelations among the factors themselves. This suggests that the indexes are good approximations of factor scores.

Nonfarm Industrial Structure

This study examines the impact of three types of economic sectors, the core, the peripheral, and the state sectors. In order to operationalize the industrial sectors, this study uses data which apply to a county labor force's industry of employment.[2] We draw upon Hodson's (1978, 1983) work and others for classifying industries as core, peripheral or state.[3]

The operationalization of industrial structure used in this study was based on fifteen comparable industrial categories available from both the 1970 and 1980 Censuses of Population. These were used to classify the employed labor force in a county for each year. The 1970 Census of Population had forty-one detailed categories which had to be collapsed in order to be comparable with the 1980 data. Similarly detailed 1980 Census of Population data was not available. Where ambiguity exists in classifying industries due to the lack of detail in Census categories, 1970 data has been used to determine the industry with the largest employment; the category as a whole is then classified as core, peripheral, or state based on the largest industrial employer. The core sector was defined as the percent of the employed county labor force in the following industrial categories: durable manufacturing, construction,

communications and public utilities, transportation, wholesale trade, finance, insurance, and real estate. The peripheral sector was defined as the percent employed in: nondurable manufacturing; retail trade; business and repair services; private households, other personal services, entertainment and recreational services. Finally, the state sector was operationalized by the percent employed in: health services and hospitals; schools, colleges, and educational services; welfare, religious, and nonprofit membership organizations, and legal, engineering, and professional services; and public administration. The classification of industries into the three categories is generally consistent with the dual economy literature.[4]

Socioeconomic Conditions

The purpose of this study is to examine the effects if economic sectors on socioeconomic aspects of counties. Because this study examines the impacts of economic sectors, measures which directly reflect the costs and benefits of these sectors are employed to represent "socioeconomic conditions." Three indicators of county socioeconomic status were selected. These are: the median family income of the county, the percent of county families in poverty, and the Gini coefficient for family income inequality.[5] Family rather than individually based indicators were used because these measure socioeconomic status or well-being at a level that has relevance for the social arrangements existing within a county; and because this study focuses on farming, which is particularly interrelated with family arrangements. The source of the indicators is the Census of Population. The Gini coefficient, though not reported directly in the Census of Population, as median income and poverty, was developed from Census income categories.

Control Variables

Several control variables are employed. The percent urbanized is employed because the organization of economic sectors varies between urban and rural areas (Moran and Tolbert, 1984; Bender et al., 1985). Secondly, urban areas have historically tended to have proportionately less poverty and higher quality of life than rural areas (Morrill and Whollenberg, 1971:20; Smith, 1982:118). Adjacency to metropolitan areas was determined from the results of the 1970 Census of Population and from reported 1980 Census data. It is a three point index, ranging from values of 0 for metropolitan counties, to a value of 2 for nonmetropolitan adjacent counties. Metropolitan counties may have more capital intensive types of farming (Heaton, 1980). Further, McGranahan (1980:315) states that the effect of metropolitan spread " has been reflected in lower median incomes and lower absolute growth incomes over time as one moves away from metropolitan center." The percent farm to rural population is used, following Swanson and Skees (1985) to partially control for a county's dependency upon agriculture. Establishment size is measured as the number of all service, manufacturing, retail, and wholesale establishments in a county divided by the number of paid employees in such establishments. The size of the establishment has been found to affect employee earnings (Stolzenberg, 1978). It should be noted that the sources of this variable were the 1967 and 1977 Censuses of Manufacture, Services, Retail and Wholesale Industries, as reported in the County and City Data Books.

The data employed in this study are from the best available sources for which county level data and data over time could be found. The original source of data for all indicators except those relating to farm structure and firm size were directly from or derived from the Censuses of Population for 1970 and

1980. Because Census data is more easily and more economically accessed from the County and City Data Books, these were employed wherever possible. For the development of the Gini index and the indicators of industry structure, the County and City Data Books, did not give the sufficiently detailed information desired by this study. As a result, we returned to the original Censuses of Population for 1970 and 1980 for these data.

There were relatively little problems with missing data. Missing farm data has already been discussed. For most other indicators, either negligible (under one percent) or no missing data were encountered. The state means for all counties were substituted for missing data when these few cases occurred. The only exception concerns the variable establishment size. These data are reported by the Census of various businesses which do not publish data which would disclose the operations of an individual establishment or business. While the number of establishments was generally available for the calculation of this indicator, the number of employees was not made available when possible disclosure occurred. For 1967 and 1977, the percent of counties having unavailable data on this variable were 22 and 24 percent, respectively. While this appears high, publicly available data sources on firms and establishments typically have such problems (Hodson, 1983:90-92). For counties for which establishment size data were unavailable due to disclosure, the mean value for all counties in the state was substituted.

Study Design

This study employs secondary data collected from government surveys, which is analyzed both cross-sectionally and longitudinally. The descriptive statistics for all variables used in the analysis are presented in Appendix B. The bivariate correlations among the variables are presented in Appendix C.

Farm and industry structure are expected to have impacts on socioeconomic status which can be observed cross-sectionally as well as over time. Studies in the Goldschmidt tradition have generally been cross-sectional, with researchers postulating, but lacking the data to test, relationships over time. This study first presents the results of the cross-sectional analyses for each of the study years, which reflect essentially, and which will be referred to, as the 1970 and 1980 time points. Then, the longitudinal analyses involving variables measured at the 1970 time point are tested for their effects on 1980 socioeconomic status. Ordinary least squares multiple regression analysis is used to test the hypotheses.[6]

A consideration in employing multiple regression analysis concerned the use of statistical tests of significance. Since we employed virtually the entire number of counties in the continental United States, the results of the analyses cannot be due to sampling error. Statistical tests of significance thus have no relevance as an inferential tool for this study. However, because they help to cull minor relationships, and because they may be of interest to the reader, we report the significance levels. We will generally consider findings as significant or as providing sufficient information with which to base decisions regarding the hypotheses, if they attain a significance level of $p < .0001$. This indicates that the observed relationships have essentially no possibility of occurring by chance, or as an artifact of the number of relationships examined.

It should further be noted that because this study employs two different types of models, one cross-sectional, the other longitudinal with a dependent lag, the independent variables are subject to different controls, which influences their magnitude. Specifically, for the cross-sectional models, the

variables have more possibility for explaining variance in the dependent variable because they are not constrained by the dependent lag. The dependent lag represents a county's prior history with respect to the dependent variable, which obviously has an enormous effect on the future potentials fo the county. As a consequence, we expect to have findings that less frequently meet the significance criterion in these lagged models. We now turn to an examination of the regression models.

The Analysis

The Effects of Farm and Industry Structure on Socioeconomic Conditions: The Median Family Income of Counties

The effects of economic structure on median family income are presented in Table 3. For 1970, the model explains about 61 percent of the variance in county median family income, indicating a reasonable amount of predictive accuracy. The industry structure variables are all in the predicted direction: counties with greater core and state employment have higher median family incomes, while the converse is true for counties with higher peripheral employment. However, only the relationships with core (beta = .145) and peripheral employment (beta = -.080) are significant. It should be noted that the industry structure measures are all in the same direction as the zero order correlations, indicating that the controls did not change these initial directions.

All three farm indicators had low positive zero-order correlations with median family income. When the impacts of each have been controlled for, counties with a greater extent of larger family farming are found to have significantly higher (beta = .251) median family income, as predicted. In contrast to the hypotheses, counties with a greater extent of smaller family

Table 3. The Effects of Farm and Industry Structure on Socioeconomic Conditions: Median Family Income

Independent Variables	Standardized Regression Coefficients: 1970 Cross-Section	1980 Cross-Section	1980 with 1970 Independent & Lagged	Unstandardized Coefficients: 1970 Cross-Section	1980 Cross-Section
Intercept	.000	.000	.000	7095.96	14835.91
Percent in Core Employment	.145	.238	.073	2643.35	10157.24
Percent in Peripheral Employment	-.080	-.049*	-.005*	-1656.81	-2300.06*
Percent in State Employment	.041*	0.48*	-.006*	1142.00*	2711.20*
Smaller Family Farming	-.244	-.236	-.036*	-45.16	-82.56
Larger Family Farming	.251	.272	.123	46.36	94.95
Corporate Farming	.047*	.021*	-.047	8.74*	7.48*
Percent Unemployed	-.130	-.240	-.071	-10472.59	-25247.10
Establishment Size	.265	.132	-.094	137.84	149.18
Percent Farm to Rural Population	-.200	-.222	-.071	-2338.08	-6468.92
Percent Urban	.244	.266	.037*	1598.60	3252.57
Percent Black	-.374	-.303	.027*	-4617.66	-7417.26
Metro Adjacency	-.203	-.252	-.105	-483.50	-1137.96
Median Family Income 1970	N.A.	N.A.	.811	N.A.	N.A.
R^2	.613	.586	.813	.613	.586

*Not significant at $p < .0001$

farming patterns have significantly lower (beta = -.244) median family income. Finally, the positive but insignificant relationship between corporate farming is in the opposite direction as predicted.

In terms of the control variables, the direction and magnitude of these follow their zero-order correlations. The strongest predictor of median family income is found among these variables: counties with higher black populations have lower median family incomes. Establishment size is the second strongest predictor (beta = .265) in the model. Counties with larger mean establishment size have higher median family incomes, which is expected given the association of large firms with higher profits and greater market control. More urbanized counties and counties closer to metro areas also had significantly higher median family incomes, an expected finding due to the historical dominance of urbanized areas in regional economies. Counties with higher unemployment had significantly lower median family incomes, which would be expected. Counties with rural areas more dependent upon farming, likewise, had lower median family incomes. Farm employment as opposed to nonfarm employment, all else being equal, is generally peripheral, low-wage employment. All these relationships are significant by the study criterion.

The model for 1980 explains somewhat less of the variance in median family income as compared to 1970 (R^2 = .586). The relationships for both time points are basically consistent, indicating that the nature of the relationships among the variables has not changed much over the time periods. Core employment shows a moderately positive relationship (beta = .238) with median family income, as predicted. The coefficients for state and peripheral employment are in the predicted direction, but they are not significant. Thus, while peripheral employment had a low (beta = -.08) but significant relationship in 1970

with median family income, this relationship became weaker and nonsignificant for 1980. The zero-order correlations show little departure from these controlled relationships. The farm variables had low positive zero-order correlations with median family income for 1980, as they had in 1970. Their relationships in the regression model also follow those in 1970. For the control variables, the percent black in a county is still the strongest predictor of a county's median family income, while the other variables exhibit the same significant relationships with median family income as described for 1970.

The longitudinal analysis indicates the strength of the effect that the independent variables in 1970 have on the dependent variable at 1980. The explained variance of the longitudinal model is about 81 percent, indicating that the county's prior history with respect to median family income coupled with the effects of the independent variables largely explains the median family income of counties. The effects of the lag itself are expectedly high (beta = .811). Squaring the correlation coefficient between the 1970 and 1980 median family income produces an explained variance of about 78 percent, indicating that the lagged dependent variable has an enormous impact on its 1980 value. As a result, we expect that contributions to the explained variance in median family income by the other variables will be low. However, previous findings showed that without the lagged dependent variable, about 56 percent of the variance could be explained by the model, almost as much variance accounted for as by each cross-sectional model. Thus, it appears that the effects of the independent variables do indeed endure over time.

For the purposes of hypothesis testing, the only industry structure variable with a significant impact on median family income was core employment

In summary, the results of the findings in regard to farm and industry impacts are: the greater the core employment and larger family farm structure patterns, the higher the county median family income. These support the initial hypotheses. In contrast to our predictions, smaller family farming, for the cross-sectional models has significant negative relationships with median family income, and a negative but nonsignificant relationship in the lagged model. This does not support the hypothesis that smaller family farming would produce higher socioeconomic status. Corporate farming has no significant relationship with median family income in the cross-sectional models. However, the lagged model indicates that corporate farming may influence future family incomes potentials in counties. It is possible that because this type of farming is more locationally specific, and also less frequent, we are unable to fully discern its impacts, as compared to the impacts of the other farming patterns. Peripheral employment supports the hypothesis of a negative impact on median family income, only in the model for 1970; there are no other significant relationships with median family income, although the signs of the betas are in the predicted direction. Finally, state employment shows no significant relationship with median family income, in contrast to the positive relationships predicted. We now turn to an examination of the impacts of farm and industry structure on poverty.

The Effects of Farm and Industry Structure on Socioeconomic Conditions: Family Poverty in Counties

The findings of farm and industry impact on poverty are presented in Table 4. The model for 1970 indicates that about 56 percent of the variance in poverty across counties is explained. When the effects of the independent variables are controlled for, neither state nor peripheral employment have a

Table 4. The Effects of Farm and Industry Structure on Socioeconomic Conditions: Family Poverty

Independent Variables	Standardized Regression Coefficients: 1970 Cross-Section	1980 Cross-Section	1980 with 1970 Independent & Lagged	Unstandardized Coefficients: 1970 Cross-Section	1980 Cross-Section
Intercept	.000	.000	.000	.191	.248
Percent in Core Employment	-.128	-.347	-.156	-.124	-.266
Percent in Peripheral Employment	-.012*	-.191	-.102	-.013*	-.160
Percent in State Employment	-.020*	-.131	-.027*	-.031*	-.133
Smaller Family Farming	.230	.182	-.007*	.002	.001
Larger Family Farming	-.243	-.177	-.052	-.002	-.001
Corporate Farming	-.039*	-.042*	.021*	-.000*	-.000*
Percent Unemployed	.189	.280	.080	.814	.530
Establishment Size	-.171	-.074	.091	-.005	-.001
Percent Farm to Rural Population	.111	.072*	.062	.070	.038*
Percent Urban	-.173	-.092	.021*	-.060	-.020
Percent Black	.568	.554	.067	.375	.243
Metro Adjacency	.125	.135	.015*	.016	.011
Poverty 1970	N.A.	N.A.	.824	N.A.	N.A.
R^2	.560	.548	.811	.560	.548

*Not significant at $p < .0001$

significant relationship with county poverty. Core employment has a negative relationship (beta = -.128) with poverty as hypothesized. For the farm structure variables we find the same relationship as in the model for median family income: larger family farming is negatively related to poverty (beta = -.243), while smaller family farming is positively related to poverty (beta = .23). Corporate farming has little relationship (beta = -.039) with poverty, and further the direction of this relationship is opposite as predicted. The strongest predictor of poverty is found among the control variables, the percent black in a county (beta = .568). All the control variables have significant impacts upon poverty and these follow the same direction for median family income: less poverty is found in counties with less unemployment, higher average establishment size, more urbanization and metro adjacency, less farm to rural population.

In 1980, the model explains slightly less variance as compared to 1970. All three nonfarm industries have significant negative relationships with poverty, in contrast to the negative relationship expected for peripheral employment. both core and state employment have the significant, predicted relationship in reducing poverty, with stronger impacts found for core (beta = -.347) as compared to state (beta = -.131) employment. Examining the effects of farm structure for 1980, we find essentially the same relationship as for 1970: larger family farm structure significantly contributes to poverty reduction, while smaller family farming has a significant positive relationship with poverty. Corporate farming shows little relationship to poverty. Finally, an examination of the control variables reveals all relationships in the same direction as for 1970, but with a nonsignificant relationship for

percent farm of the rural population. Again, the percent black in a county is the major (beta = .554) predictor of county poverty.

The model examining the impact of the independent variables at 19790 upon county family poverty in 1980 indicates an explained variance of about 81 percent. The 1970 lagged dependent variable explains about 77 percent of the variance in 1980 poverty, indicating that the independent variables have little variance left to explain. Previous findings showed that without the 1970 lagged poverty indicator, about 51 percent of the variance could be explained by the model, only slightly less than the amount explained by the cross-sectional model. Again, as with median family income, the effects of the independent variables upon county poverty appear to hold across time. The impact of 1970 industry structure upon 1980 county poverty support the consistent finding (beta = -.156) that core employment increases socioeconomic well-being in counties. Counties with higher core employment in 1980 had lower family poverty rates in 1980. In contrast to the hypotheses, peripheral employment is found to significantly reduce poverty, while state employment shows essentially little relationship with poverty. When a county's prior history is controlled for in regard to poverty for the farm variables, only larger family farming has a significant (beta = -.052), although low impact upon poverty. The relationship with corporate farming is in the predicted direction, but the beta (.021) is small and nonsignificant. The reduction of the effects of larger family farming is not surprising, given the small amount of potential variance to be explained in the lagged model. Smaller family farming was not related to poverty. Finally, the effects of the control variables should be noted. The percent black, farm to rural population, and percent

unemployed for 1970 are significantly negatively related to county poverty in 1980. The percent urban and metro location show little relationship with poverty. Mean establishment size follows the pattern observed for the lagged median family income model: counties with larger mean establishment size in 1970 have lower socioeconomic conditions in 1980. As discussed, this may indicate that highly industrialized, large firm areas were negatively impacted by deindustrialization during the 1970s.

The effects of the industrial and farm structures on poverty are not as clear as those for median family income. Employment in the core sector shows a consistent significant relationship with higher socioeconomic conditions, which has been found to hold for poverty as well as median family income. In regard to state employment and poverty, only one of the models, the cross-section for 1980, shows a significant negative relationship; the models in general do not show that state employment increase county socioeconomic conditions significantly, and hence is not supportive of this hypothesis. The significant negative relationship between peripheral employment and poverty was not expected and runs counter to our predictions. The farm structure variables have a somewhat similar relationship with poverty as they had with median family income. For all three models, larger family farm patterns are significantly negatively related to poverty and thus support the hypothesis that larger family farming patterns contribute to higher county socioeconomic well-being. For the cross-sectional models and smaller family farm patterns, the relationships run counter to the hypothesis that smaller family farming would reduce poverty. Finally, corporate farming shows little relationship with family poverty, in contrast to the slight negative impact found in the lagged model for median family income. This study now examines the relation-

ship between farm, industry structure, and income inequality in a further assessment of the hypotheses.

The Effects of Farm and Industry Structure on Socioeconomic Conditions: Income Inequality

The analysis for farm and industry structure impacts on the measure for income inequality, the Gini coefficient, is presented in Table 5. The percent variance explained by the model for 1970 is somewhat lower than that poverty and median family income (R^2=.466), indicating that the model does not have quite as good a fit. Examining the effects of industry structure on family income inequality, we find essentially the same pattern as for the other dependent variables at this time point: core employment has a significant negative relationship with income inequality, while the effects of peripheral and state employment are nonsignificant. Core employment, in fact, has the second strongest relationship (beta = -.240) in the model, the first being the percent black in a county. The farm structure variables also follow their previous patterns for this time point: larger family farming is significantly negatively related to income inequality, while counties with a greater extent of smaller family farming have higher income inequality. There is little relationship between corporate farming and income inequality. Finally, the control variables maintain essentially the same relationship as they did for 1970 poverty and median income, with all variables except the percent urbanized in a county significant predictors of income inequality. The percent black population is again, the strongest predictor in the model.

The 1980 model explains almost 50 percent of the variance in income inequality in counties, a slightly better predictor than the 1970 model. The pattern of relationships for 1980 is strikingly similar to that for 1980

Table 5. The Effects of Farm and Industry Structure on Socioeconomic Conditions: Income Inequality

Independent Variables	Standardized Regression Coefficients: 1970 Cross-Section	1980 Cross-Section	1980 with 1970 Independent & Lagged	Unstandardized Coefficients: 1970 Cross-Section	1980 Cross-Section
Intercept	.000	.000	.000	.397	.445
Percent in Core Employment	-.240	-.397	-.205	-.099	-.162
Percent in Peripheral Employment	-.064*	-.221	-.111	-.030*	-.099
Percent in State Employment	.008*	-.151	-.059	.005*	-.081
Smaller Family Farming	.172	.198	.056*	.001	.001
Larger Family Farming	-.161	-.190	-.110	-.001	-.001
Corporate Farming	.014*	.009*	.032*	.000*	.000*
Percent Unemployed	.105	.111	.059	.191	.112
Establishment Size	-.216	-.164	-.008*	-.003	-.002
Percent Farm to Rural Population	.174	.078*	-.019	.046	.021*
Percent Urban	-.040*	.050*	.053*	-.005*	.006*
Percent Black	.509	.535	.196	.142	.125
Metro Adjacency	.112	.153	.069	.006	.007
Income Inequality 1970	N.A.	N.A.	.606	N.A.	N.A.
R^2	.466	.495	.656	.466	.495

*Not significant at $p < .0001$

poverty. All three industrial structures have negative impacts on inequality; however, the strongest relationship, not surprisingly, is with core employment (beta = -.397). State employment had no relationship with income inequality. The controls thus did not alter these intitial relationships, but rather appeared to increase their magnitude. The relationships for the farm structure variables follow those observed in the previous cross-sectional models for median family income and poverty: smaller family farming, in contrast to the hypotheses, has a positive impact on income inequality, while larger family farming has negative impact. Corporate farming has no association with this indicator. Finally, the controls have essentially the same relationship to income inequality as those observed in the previous cross-sectional models. However, the percent rural farm population and the percent urban are no longer significant predictors, although their direction remains unchanged. An interesting finding in the models for both poverty and income inequality has been that the percent rural farm population decreases in the magnitude of its negative impacts on socioeconomic status bsteeen 1970 and 1980. This suggests that rural farm areas may be undergoing change and losing their uniqueness as nonfarm factors, such as the nonfarm economy or state subsidized services and programs, penetrate these areas.

The longitudinal model for income inequality explains about 66 percent of the variance in this indicator, indicating somewhat less explained variance in comparison with the other models. The lagged dependent variable alone explains about 61 percent of the variance in 1980 income inequality. Previous findings showed that the model without the lagged variable could explain about 35 percent of this variance. The longitudinal model for income inequality is largely consistent with the other longitudinal models. As predicted, core

employment makes significant contributions to the reduction of income inequality. Not found by the other models is also a significant contribution (beta = -.059) of the state sector toward increasing socioeconomic status: counties with more state employment in 1970 had reductions of income inequality in 1980. This finding suggests that the regulatory, income-transfer, and employment functions of the state in the economy reduce income inequality in counties with greater state industry, and potentially, the social disruption that such inequality may engender. Peripheral employment is also significantly negatively related (beta = -.111) to income inequality, which runs opposite to the hypotheses. For the farm structure variables, only larger family farming significantly contributes to a reduction in income inequality. The relationship for smaller family farming is not significant and in the opposite direction predicted. For corporate farming, the direction is as predicted, but the magnitude of the beta (.032) is not significant. Finally, the significant control variables, percent unemployed, percent black, and metro adjacency follow the patterns of the cross-sectional models.

To summarize the results of the hypotheses concerning the effects of industry and farm structure on income inequality: core employment significantly reduces income inequality, as hypothesized. The results for the state sector are mixed. Only two models indicate support for the hypothesis that the state sector should increase socioeconomic status or reduce poverty. The results for the peripheral sector are contrary to the hypothesis, and for two models indicate the converse relationship. For the farm variables, the finding that larger family farming significantly raises socioeconomic status is consistent for income inequality as well. The hypothesized positive relationship between smaller family farming and higher socioeconomic conditions is not

found in this analysis. On the contrary, two models show smaller family farming to have a significant negative impact on imcome inequality. Corporate farming was not significantly associated with income inequality, although all relationships were in the predicted direction.

Summary and Conclusions

The impacts of farm structure and industry structure upon three measures of county socioeconomic conditions, median family income, the percent of families in poverty, and income inequality, were tested. The three income based measures of socioeconomic status were highly intercorrelated and tended to exhibit a generally consistent relationship with the economic structures. the relationships among the three indicators is consistent with other literature (Betz, 1972; McGranahan, 1980; Morrill and Wohlenberg). Areas where incomes are higher, generally have less income inequality. Perry (1980:140), citing Lenski (1966), states that increases in income are likely to be shared, in order to ensure social stability and to stimulate production.

First, we summarize the findings for farm structure. The most consistent finding for this analysis has been that the larger family farming pattern positively contributes to county socioeconomic status. This relationship was observed for all three indicators of socioeconomic status. The longitudinal analyses allowed stronger causal inferences to be drawn. Counties with a greater extent of this pattern in 1969 were likely to have higher median family income and lower poverty income inequality by 1980. It should be noted that a direct comparison of these results with those of other studies requires consideration of the salient indicators of this dimension. This dimension reflects capital intensive, part-owner and tenant operated farming conducted in counties with much land in farming. Relatedly, such farms employ little hired

labor and tend to be owned independently or in partnerships. From Buttel's (1983) observations, farms with these characteristics are market orientated and profitable. Such farms are not simple commodity production units in the sense that their operators own all production factors; rather they reflect the differentiation of such producers by the market economy. Though the dimensions of farm structure employed in this study have not been examined by other researchers in tests of the Goldschmidt hypothesis, these findings suggest support for the positive contributions of noncorporate, family organized farms, using little hired labor, for counties. Thus, that aspect of the Goldschmidts hypothesis which postulates the positive impacts of family labor farming would seem to be supported by this study. Other research has used different indicators, such as scale and control over production factors to argue for the positive impacts of noncorporate, family organized farming. Although the measures employed in this study are not directly comparable, such studies would also seem to lend support to the findings. These include: Tetreau (1938, 1940); Heffernan (1972); Rodefeld (1974); Martinson et al. (1976); Fujimoto (1977); Peterson (1977); Swanson (1980); Poole (1981).

The hypotheses that the smaller family farming pattern would have a positive impact on the socioeconomic status of counties were not supported. Indeed, the findings indicated the reverse relationship: counties with a higher extent of the smaller family farming pattern had lower median family income, higher poverty and higher income inequality. These findings do not support Goldschmidt's hypothesis concerning the inverse relationship between farm scale and socioeconomic well-being. However, while studies which have examined the effects of farm scale linearly have often found positive

contributions of smaller farms, recent observations have not been in as complete agreement.

The smaller family farming dimension reflects a pattern of concentration of small-scale (sales under $2500) farms, which tend to be owner-operated, resident-occupied, and part-time. There is a paucity of research addressing the characteristics and impacts of farming patterns at this end of the farm size continuum. While Goldschmidt's work has been the starting point for this and other analyses, a result of the Arvin and Dinuba study has been to direct discourse and research to the corporate or large-scale end of the farming continuum. It is possible that previous studies which have examined linear relationships between scale and socioeconomic outcomes, particularly where findings have been mixed, have overlooked curvilinear relationships and negative impacts of the smallest farms.

In this regard, Skees and Swanson (1985) make an important contribution in analyzing indicators of small scale farming: they examine curvilinear relationships of scale, measured in sales, percent of part-time operators, and concentration of small farms. They find a curvilinear relationship between farm scale and unemployment, indicating higher positive associations for both the large and small farms. Concentration of small farms was also significantly positively related to unemployment but negatively related to poverty for 1980; findings for other models assessing the impact of small farm concentration were not significant and not in consistent directions. Skees and Swanson's analysis does suggest, however, that the linear assumption of Goldschmidt's hypothesis requires modification.

The dimension of smaller family used in this study encompasses part-time farming as well. Part-time farming has generally been associated with higher

income for farm families. Such farms also tend to have low debt to asset ratios which increases their chance of survival in farming when crop years are poor (Buttel, 1983:51). Skees and Swanson's (1985) findings for the South suggest positive relationships between part-time farming indicators of socio-economic well-being. Because the indicator of smaller family farming used in this study includes both scale and organization, we are unable to assess the exact impact of part-time farming. It may be for the South that part-time farming contributes to the income of already marginalized producers and hence raises county well-being; while, for other areas it may signal the increased differentiation of farming and the decline of family labor enterprises that once sustained county inhabitants. Finally, it should be noted that this study has controlled for industry effects more thoroughly (in terms of the types of industry considered) than previous research testing the Goldschmidt hypothesis. It is possible that when the types of industries affecting county socioeconomic status are controlled for (potentially those industries employing smaller farmers and their families), the smaller family farming pattern reflects only low income farming with dubious socioeconomic benefits. In sum, this study finds that farm differentiation toward smaller scale, marginal production patterns has a negative impact on the socioeconomic status of counties.

There was only partial support for the hypothesis that the corporate/commercial farming pattern would negatively impact county socioeconomic status. This farming pattern represents incorporated farming, generating high sales, with large numbers of hired farm workers, and high expenses for contract labor and custom work. The most support for the hypothesis came from relationships observed in 1970 and for the 1970-1980 lagged models, but while many relationships were in the predicted direction, few were significant.

The findings for the corporate/commercial pattern are similar to those of more recent studies which indicate only partial support for the Goldschmidt hypothesis that large-scale, hired labor dependent farming negatively impacts socioeconomic well-being (Flora et al., 1977; Wheelock, 1979; Harris and Gilbert, 1982; Swanson and Skees, 1985; Green, 1985). Harris and Gilbert's (1982) study most closely resembles this study, as they examine the continental United States, but using state level data. They find that overall effects of farms scale on rural income to be moderately positively, but that such effects occur mainly through higher income for farmers as a whole, rather than for hired workers. This study similarly found a slight positive, but nonsignificant relationship with median family income for the two cross-sectional models.

There are several reasons why this hypothesis was only partially supported. First, industrialized farming is presumed to affect entire localities for such reasons as: such farms use local sources of inputs, finances, and marketing less; and absentee ownership does not promote interest in maintaining the community by such owners (Harris and Gilbert, 1982:453). However, a more direct impact on the community is expected from social structure, that is, the effects of low paid farm labor. Because farm labor, particularly on the largest farms may be migrant or not residing in the county where socioeconomic status is measured, this study may be unable to assess some of the negative impacts of corporate/commercial farming. For example, Harris and Gilbert (1982) found a high correlation between rural income and farmers' income, but only a low correlation between rural income and farm laborers income. According to Harris and Gilbert (1982:454), this "may be due to the low proportion of each year that many farm workers spend in the states where they earn farm income." Goldschmidt (1978) also discussed this problem in

comparing Dinuba and Arvin: Dinuba (the family farming community) required more outside labor during its peak month, although over the year the requirements for both communities were about the same. Larson (1981:154), however, notes that in 1977 only about 7 percent of all farm workers lived overnight from their place of work, with the majority drawn from their own communities. Thus, there may be a possibility, although small, according to Larson's data, that the measures of socioeconomic status do not incorporate farm laborers.

A second reason why the impacts of corporate farming are not observable may be due to the location of industrialized farming. The largest industrialized, hired labor dependent farms tend to be located in California, Florida, and some parts of the Southwest. It is possible that by examining the entire United States, the effects of these large farms are not as apparent.

Finally, it is possible that the effects of such farming have changed over time. The findings for this study showed somewhat stronger negative impacts in 1970 and with the lagged models; for 1980, there tend to be negligible impacts. As corporate farms become more capital intensive, and as labor becomes more organized, it is possible that job conditions will begin to approach those in nonfarm, capital intensive, large-scale industry. In addition to changes in the nature of industrialized farming, nonfarm factors affecting the characteristics of localities may have changed since Goldschmidt's study. Skees and Swanson (1985:55) note that the Office of Technology Assessment studies find four factors tend to reduce the negative impacts of industrial-type farming in areas where it occurs. These are: welfare benefits and labor laws that are favorable to hired workers; the presence of nonfarm employment, which in addition to providing additional off-farm income, may drive up wages paid by industrial farms; high skill levels in the local population; low diversity

among ethnic groups. These factors can be applied to compare the historical setting of thee Goldschmidt hypothesis with that of later research. Because later research does not appear to support Goldschmidt as strongly, there is the possibility that recent factors, such as state intervention (welfare programs and more favorable labor laws), increased nonfarm employment, and changes in corporate farming itself, have altered the nature of the relationship between communities and corporate farming. Where four decades ago Goldschmidt's independent variables could be largely local and farm related, recent work suggests that these are currently insufficient in explaining the interrelationships between corporate/commercial farming and socioeconomic status. Moreover, the more critical impacts of corporate farming may not be found at the local level. This later topic is discussed in the section dealing with the implications of this study.

As economic development progresses, the importance of farming for employment declines. Lenski (1966) explains that with the advance of technology, it simply becomes easier for fewer individuals to produce greater quantities of food and fiber. The farm population fell by 70 percent between 1940 and 1970, and included only three percent of the total U.S. population in 1978 (Larson, 1981:15). Over time, it would be expected that the impact of farming on socioeconomic status should decline, as nonfarm factors become of greater economic importance to localities. The regression models, however, indicate that farming still has current importance in determining county socioeconomic status when other variables are controlled for. It should be noted that in testing the hypotheses, by employing three measures of farming alone, we increase the possibility of finding farm-socioeconomic status interrelationships. As examining such interrelationships was an important goal of the

study, this was appropriate. At the county level, farming is also very important: twenty-nine percent of all nonmetro counties were considered farming-dependent or having "a weighted annual average of 20 percent or more of labor and proprietor income from farming from 1975 through 1979" by the U.S.D.A. (Bender et al., 1985). This represents about one-quarter of the counties employed in this study. Thus, by examining industry and farming at the county level, we also increase the possibility of finding farm-socio-economic status impacts.

We now turn to a discussion of the impacts of industry on socioeconomic status. The hypothesis that core industry would be positively related to higher county socioeconomic conditions was generally supported. Core industry included: durable manufacturing, construction, utilities, transportation, wholesale, finance, insurance, and real estate. Counties with a greater percent of their employed labor forces in this employment had higher median family incomes, less income inequality, and less poverty. These findings are congruent with those of other studies, which have examined the impact of segmented industry sectors (in this case, operationalizations of the core sector) upon: workers' earnings in industries (Beck et al., 1978; Hodson, 1978); workers earnings and lower labor force poverty in SMSA's, with indirect effects on SMSA poverty rates (Tomaskovic-Devey, 1985). Relatedly, Horan and Tolbert (1984:67) found that a high wage manufacturing dimension was positively correlated with median income and negatively correlated with income inequality for Southern county labor markets.

The hypothesis postulating a negative relationship between peripheral employment and socioeconomic conditions, were in general, not confirmed. The most support for the hypothesis was observed in the relationship with median

family income: peripheral employment was significantly, negatively related to median family income in 1970, and in the same direction, but not significant for the 1980 cross-section and lagged models. For the other income-based socioeconomic indicators, the relationships were either not significant or in the opposite direction as hypothesized. The negative findings with regard to median income do indicate, however, perhaps an indirect association with poverty and income inequality, since a greater extent of this employment in counties seems to lower incomes.

There are several potential reasons why no strong negative relationships were found with this indicator. First, the impact of segmented economic sectors is expected to be most evident in the earnings of employed workers; perhaps this impact is not as direct with other income variables that are measured on a family basis and that include government transfer payments. Political demands for higher welfare and related income transfer benefits and workplace unionization might mediate the economic effects of county peripheral employment. Tomaskovic-Devey (1985a) found that core and service industry had no significant direct effect on per capita poverty rates for SMSA's: of the two industry structure measures used in the study, only the core sector had an indirect effect on poverty through its reduction of labor force poverty and increase in job earnings. Thus, the relationship between industry structure and socioeconomic status may not be as direct as hypothesized. Median family income would seem to be the closest indicator in our study to correspond with job earnings, and this variable reflects the hypothesized direction with peripheral employment.

However, it should also be noted that peripheral employment was significantly negatively related to income inequality and poverty in the 1980 and

lagged models. This suggests that job quantity, as well as job quality, has some positive impact on county socioeconomic status. Studies examining nonmetropolitan industrialization (Summers et al., 1976; Till, 1981) have also noted that although the quality of employment brought to nonmetro areas tends to be low, such employment generally results in income, population, and employment increases for local residents.

The findings for state employment partially supported the hypothesis that state employment would be positively related to county socioeconomic status. The state sector was operationalized by the percent of the employed labor force in such services as health, education, welfare and related services and public administration. It was expected that state sector employment would contribute to socioeconomic status because it would provide fairly high earnings for workers and because it would be an indicator of service extensions to counties. State employment tended to follow the predicted direction, but few significant findings were observed. The models for income inequality and poverty seemed to give greatest support to the hypothesis. Interestingly, median family income had little relationship with this variable. These results suggest that the state reduces economic inequality but does not contribute to overall higher incomes, as productive employment in the core sector woudl. Such findings correspond to O'Connor's (1973) arguments concerning the role of the state in outlaying services and employment to ensure legitimation or social harmony.

The most consistent finding in regard to industry structure was the positive impact of core employment on the socioeconomic income-based measures. While peripheral employment also showed some positive impacts on these measures, in contrast to the hypotheses, these were not as strong as for core

employment. The analysis indicates that the quality of employment generated by privatized core industry has an important impact on the socioeconomic status of counties, and particularly, for raising family incomes. The reduction of poverty and of income inequality in counties is not as dependent on qualitative employment. State employment, which may be suggestive of state service outlays as well, and peripheral employment show a tendency to reduce the level of absolute deprivation or poverty and the level of income inequality in counties; however, these industries do not figure significantly in raising median family income and thereby improving relative income levels.

Implications

Theory and Research

This study points to the importance of examining differentiation in farm and industry structure in assessing the interrelationships between economy and society. Industrial sociologists and researchers in the sociology of agriculture have tended to neglect the insights of each others' work, in this respect. Farming tends to be viewed as a homogeneous sector by industrial sociologists; likewise, those in the sociology of agriculture tend to assume that all nonfarm industry is qualitatively the same. Internal differences in farm and in nonfarm industry structure, however, require particular consideration when the goal of studies is to measure socioeconomic outcomes.

This study also has implications for further work in the Goldschmidt tradition. It is the first study to examine the entire United States, at the county level in a test of the Goldschmidt hypothesis. First, this study shows that multiple indicator measures of farm structure, in contrast to the single indicators used in previous studies, are important in allowing complex dimensions of farming to be examined. Such indicators more closely tap the empir-

ical reality of variegated farm structures. Studies examining the Goldschmidt hypothesis, for example, often employ measures of scale, assuming a linkage between scale and organization. This linkage may not always be accurate: technological changes may allow for greater scale, while not necessarily altering salient organization factors; contract farming presents the opposite case where farm scale has not changed dramatically but the organization of production has. It is thus essential to know how measures of scale are linked to measures of organization and other household/operator characteristics as well. Though the data limited the types of such relationships that could be examined, this study shows the importance of developing multiple indicator measures to capture the dimensions along which differentiation has occurred in farming, and hence to better study farm-socioeconomic interrelationships.

Relatedly, this study shows that farm structure--socioeconomic conditions should not be viewed linearly and dichotomously, or in terms of contrasting large-scale industrial-like farming with smaller farming patterns. This study agrees with Skees and Swanson's (1985) suggestion that the farm-socioeconomic status relationship requires respecification. The negative impact of smaller family farming observed in this study indicates that future research should not be premised unequivocally on linear assumptions. Further research is also needed to examine whether the negative impacts of smaller family farming found in this study hold at regional levels.

Finally, this study suggests that the effects of corporate/commercial farming upon localities may be changing over time. There is only partial support for the hypothesis that corporate farming negatively impacts counties, and this support seems far greater in the 1970 period. Potentially, changes in the impact of corporate/commercial farming on counties could be related to both

changes in the nature of corporate farming itself and county development changes. In examining the interrelationships between farming and industry, corporate farming shows also little relationship, either as a predictor or predicted variable, with industry. While regional analyses would help clarify this, it appears that localistic factors are not highly affected by nor highly affect corporate farming.

Though the work of Goldschmidt has greatly contributed to research in the sociology of agriculture, it also resulted in a tendency to center discussion of corporate/commercial farming upon localistic issues. The impacts of corporate/commercial farming, however, have implications that reach far beyond the counties in which such farms are located. These concern the loss of democratization in food production. The growth of corporate farming indicates the concentration of production by a few producers. Control of the farming sector is particularly important due to the recent increases in food exports. De Janvry (1982) notes that the United States economy is becoming increasingly dependent upon agricultural exports in order to protect the balance of payments as industrial exports have fallen. Controlling interests in farming have the potential for determining the position of the United States in the world division of labor and thereby shaping the course of the economic development of both domestic industry and agriculture. Further research assessing the impact of corporate/commercial should be directed to such national issues.

Policy

The differentiated development of farming and industry results from historical processes related to the dynamics of the economic system. Though such development may have negative consequences for individuals and their localities, in suggesting change, it should be noted that negative consequences

for one group may mean positive consequences for another. For example, this study found that the percent black in a county was a major predictor of lower socioeconomic status. Discrimination has historically benefited some groups at the expense of others. In suggesting policy changes, research needs to keep a realistic perspective on what can be achieved under the present economic and political system.

Because counties have variegated industry and farming structures, policies should be tailored to specific needs. As a general prescription, at the local level, counties seeking to increase industrial development need to encourage high quality industries. This study has not considered the many issues involved in industrializing farming areas, such as the proper amount of industry needed to sustain farmers and their households without marginalizing producers; rather, we suggest that the proper quality industry be encouraged in farming areas. Although smaller family farming does not contribute to higher socioeconomic status, individuals who choose to remain in such farming should have the possibility of access to good jobs, which core employment would provide. Localities can also facilitae noncorporate farming and discourage industrialized farming by regulating land use. Finally, workplace organizations, whether in farming or industry can strengthen the demands of wage labor, which in turn, should lead to higher socioeconomic conditions.

This study has found that larger family farming positively contributes to county socioeconomic status. Federal and state policies should be designed to sustain these county farming patterns, because they contribute to higher socioeconomic well-being as well as to the democratization of farm production.

Notes

1. In 1969, the Census of Agriculture reported complete and reliable data for 3050 counties. In 1978, the Census compiled data on 3075 counties. Twenty-two of these had less than ten farms and therefore, the Census did not publish complete data on these counties. The twenty-two counties were deleted from the analysis. Combining the 1969 data with the 1978 data produced 3046 observations with farming data for both years.

While reported farming activity was the major criterion for including a county in the analysis, other modifications regarding the inclusion of counties had to be made. One South Dakota county had no data published in the Census of Population for 1980 because county division status had been redefined for the area. This county was excluded from the analysis. The Alaskan and Hawaiian counties for which the Census of Agriculture reports data were also excluded from the analysis. For the 1978 Census, these totaled five and four counties, respectively, although one Alaskan county had already been deleted from the analysis because it did not have comparable farm data for both 1978 and 1969. Alaska and Hawaii were excluded because the Census of Population redefined census divisions in both states in 1980, but most extensively in Alaska. Further, it has been argued that because these states represent relatively unique agricultural production systems, they merit exclusion from national studies of farm structure (Gilles, 1980:334). The number of counties employed in this study thus totaled 3037.

2. Theorists in economic segmentation research have also acknowledged that measures based on the firm of employment are important as well for understanding the implications of economic segmentation, since some industries may be crosscut by varying corporate structures (Baron and Beilby, 1980;

Wallace and Kalleberg, 1981). However, researchers have argued that examining employment by industry rather than by firm is justified for a number of reasons. First, Wallace and Kalleberg (1981:92) note that firms operate within the context of an industrial structure which defines the parameters of firm operating characteristics. Secondly, Wallace and Kalleberg (1981:92) state that, in addition to theoretical considerations,

> ...the choice of industries offers many strategic benefits for an analysis of the dual economy. In particular, government agencies, economists, sociologists, and business organizations typically collect data on firms that are aggregated to the industry level. In addition, most national data sets identify an individual's industry but not the name of the employer.

Third, according to Hodson (1978:441), firms and their industrial locations often coincide, because many industries are accessible exclusively to monopoly firms, such as electronics and aerospace. Relatedly, Hodson (1978:441) states that U.S. government trade union legislation and minimum wage legislation have industry specific effects and "...aggravate the segmentation of production, which is organized at the firm level, into sectors corresponding to industrial categories." Thus, this study follows others in the dual economy tradition that have employed industry rather than firm level data (Beck, Horan and Tolbert, 1978; Hodson, 1978; Wallace and Kalleberg, 1981; Schervish, 1983; Tomaskovic-Devey, 1985a,b).

3. Industrial sociologists have been concerned with the classification of industries into core, peripheral, or state, because of the implications each sector has for employment and income (Wallace and Kalleberg, 1981:91). Hodson's operationalization of these sectors gives this study a basis for classifying the industrial location of a county's labor force so that such implications can be tested. Hodson (1978) classified industries into core,

peripheral, and state sectors based upon the size of capital, the amount of economic centralization, and amount of state contracting. In specific, core industries were distinguished from peripheral by two indicators of economic concentration and by concentration ratios of employees and the value of shipments. The state sector was operationalized as all federal, state, and local government employees, employees in gas and electric utilities, and in ordinance. In a later work, Hodson (1983) performed a cluster analysis on key industrial indicators using measures of concentration, employment, assets, net income, foreign dividends, federal purchases, and percent unionized. The study excluded state industry. He found a sixteen cluster solution which he aggregated to represent six industrial categories. The six categories present a more detailed breakdown of core and peripheral industry types.

While this study draws from Hodson's (1978, 1983) work, the work of other researchers in the dual economy tradition is also employed where Hodson's categorizations cannot be clearly applied. This generally occurs where there is insufficient detail to separate out industrial categories (in accordance with Hodson's) which have been combined by the Censuses of Population, the source of this study's data. Finally, in two respects, this study specifically uses a classification other than Hodson's. First, because this study is interested in the outcomes of industry structure for county socioeconomic welfare, we must consider the state both as an employer and as a provider of social services and welfare. In order to more homogeneously examine both state functions, the state sector will be restricted to employees involved in "production of goods and services organized by the state itself," such as education, public health, welfare and social services (O'Connor, 1973:17) and to related nonprofit services. Thus we exclude industries, such as utilities

and ordinance which are organized by the private sector. Secondly, the extractive sector, foresting, farming, fishing, and mining are treated as a separate category. There were both conceptual and methodological reasons for this. Methodologically, the extractive industries were combined into one category for 1980 which did not permit analysis of any one individual industry. From a conceptual standpoint, some researchers have argued that extractive industries are not easily classifiable into core or peripheral sectors and hence, require separate consideration. Schervish (1983:125) argues that farming be treated separately from the core, periphery, and state sectors because of the workings of the product market in farming, which are not wholly regulated by either free market or state. Bibb and Form (1977) likewise excluded agriculture, forestry, and fishing from their analysis of industrial sectors. Horan and Tolbert (1984) incorporated agriculture, forestry, fishing and mining as the "extractive" industries, which they treated as a distinct industrial sector. For methodological reasons, the extractive sector is excluded from the analysis. If included as a separate industrial category, it would have resulted in orthorganality in the regression models; and further it correlated highly with farm related variables, such that it would heighten collinearity in the models.

4. This study follows Hodson's (1978, 1983) placement of most durable manufacturing and construction in the core. In addition, following Hodson (1983), wholesale is placed in the core. While Hodson's (1978) study places major utilities (electric and gas) in the state sector, in his later work, he incorporates these in the core. Because this study has defined the state sector as social service, nonprofit employment, utilities are incorporated in

the core. Following Hodson's (1983) placement of major communications and transportation, and studies by Beck et al. (1978), Bibb and Form (1977), and Tomaskovic-Devey (1985), this study places communications and transportation in the core. Finally, finance, insurance and real estate, combined in one category by the Census, are placed in the core following Beck et al. (1978). Hodson's (1983) data had suggested finance and insurance should be placed in the core, while real estate was peripheral; however, the data did not allow for such distinctions. This classification attempts to group those industries generally having large, centralized capital, monopoly pricing, high unionization, progressive technology, and high profits in the anticipation that such characteristics produce a highly paid labor force.

The classification of peripheral industries generally follows Hodson (1978, 1983). A few exceptions occur in the placement of some types of nondurable manufacturing (specifically chemicals, petroleum, and rubber) for which data had been combined with all other nondurable manufacturing. However, examination of more detailed 1970 census data revealed that the major employment in the nondurable category was in (1) not specified nondurable manufacturing and (2) textiles and fabricated textile products. Both are considered peripheral categories in the dual economy literature (Bibb and Form, 1977; Beck et al., 1978; Hodson, 1978). As a result, placing the nondurable category in the periphery seemed to best characterize this manufacturing category in the periphery seemed to best characterize this manufacturing type. This classification attempts to incorporate industries with labor intensive production, lack of unionization, and under competitive market conditions--factors which are expected to result in lower wages of a county's employed labor force.

Finally, operationalization of the state sector varies somewhat from

Hodson's (1978), due to the nature of the study. The state category includes health, education, welfare, and social services as well as nonprofit organizations. We have also delineated the extractive industries as a separate but excluded, industrial category.

5. The socioeconomic conditions employed are described in more detail below.

Median Family Income

The effects of farm and industrial structure should be evident upon a county' median family income. Family income measures the total money income received by all family members covering the calendar years 1969 and 1979 respectively, as reported by the 1970 and 1980 Censuses of Population. The measure reported by 1970 Census was based on income received by those 14 years and over; for 1980, the Census the income base was changed to those 15 and over. The composition of families is determined for each census year. Median family income is the dollar amount which divides the income distribution into two equal groups, those with incomes above the median and those with incomes below. The median rather than the mean is employed as a measure of central tendency because it is less sensitive to extreme income values.

It should be noted that the money income reported by the Census includes cash government transfers, such as AFDC (Aid to Parents with Dependent Children) and social security payments. Thus, median family income measures not only the effects of the privatized economy but state intervention as well. It is expected that core and state industries and larger and smaller family farming will have positive impacts on median family income.

Poverty

Smith (1982) notes that in order to understand the existence of poverty, recognition "of the way in which the economy allocates resources and distributes benefits and penalities in different places" is required. Core and state employment and noncorporate farming should be related to lower poverty for the counties in which these occur.

The official U.S. poverty income level was originally defined by the Social Security Administration in 1964 and later modified by a Federal Interagency Committee in 1969. The poverty level is a measure of absolute deprivation, in that below this income level, an individual or family is determined to be deprived of the basic necessities of life. The poverty income level is based upon the costs of adequate nutrition under "emergency or temporary use when funds are low" which are then trebled to cover the cost of other necessities (Morrill and Whollenberg, 1971). Adjustments for a number of factors, such a family size, sex and age of the family head, number of children under 18 years, and farm and nonfarm residence, are made to determine poverty income thresholds or cutoffs. The income cutoffs are also revised annually to reflect changes in the Consumer Price Index.

The poverty level is based upon money income and does not include noncash government supports, such as food stamps, rent supplements, and medicare and medicaid payments. As previously noted however, money income does include cash transfer income. Tomaskovic-Devey (1985a,b) argues that a poverty rate calculated on pre-transfer income would be more useful in understanding the effects of industrial structure. A pre-transfer income poverty rate would give closer representation of the actual amount of poverty produced by the normal operations of the labor and capital markets under the present welfare state

economy. Data for county poverty as for median family income, however, are only reported based on official Census definition.

The 1970 and 1980 Censuses report the number of families having incomes which fell below the poverty level for 1969 and 1979, respectively. The measure of poverty used in this study is the percent of all families in a county with incomes falling below this level. In 1969, the poverty level threshold for a nonfarm family of four was $3,721 (U.S. Bureau of the Census, 1977:xxxv). In 1979, the poverty level for a similar family would be $7,412 (U.S. Bureau of the Census, 1983:xxxvii).

Income Inequality

Core employment and noncorporate farming in counties should uplift income levels as well as diminish differences in income inequality. Betz (1974:38) has noted that studies have consistently shown a "negative relationship between income level and different measure of income inequality" for various geographical and political units.

The most common general measure of inequality in distribution is the Gini coefficient (Smith, 1982:28). The Gini coefficient is appropriate for ratio level data, which have a theoretically fixed zero point, such as age and income (Allison, 1978:870). Some researchers have also argued the Gini index is appropriate for interval level data as well and have employed the index for distributions of intelligence measures or socioeconomic prestige scores (Allison, 1978:870). This study employs the Gini index for inequality calculated on the basis of family income for 1969 and 1979, as reported in the Censuses of Population for 1970 and 1980, respectively. For both years, the Gini index was computed on the basis of grouped family income data following procedures indicated by Kendall and Stuart (1961:46-50) and Proctor (1985).

Income distributions for each year were specified in equal group intervals; and since, the last income category reported in the Census is always open-ended, this interval was defined as having the same length as the previous closed category. The Gini index measures how evenly family income is distributed across these income categories.

The Gini coefficient has a range of 0 to 1, indicating a progression from perfect equality to perfect inequality. It is defined in terms of the Lorenz curve, which is a plot of the cumulative proportion of units, in this case, families, associated with each income level. If both sets of proportions ascended with the same magnitude, the result would be a diagonal line, indicating that income was evenly distributed across family income categories and hence, that perfect equality existed. The Gini index is defined as the area between this line of perfect equality and the plot of the observed distribution (Smith, 1982:28).

6. In order to employ multiple regression, this study had to be concerned with the extent that the previous assumptions were met. The analysis showed no evidence of unacceptable collinearity among the independent variables. The residuals for the regression models were also examined to check for departures from the assumptions. There were no major departures observed. Regarding the cross-sectional models, in some cases, error terms tended to be somewhat heteroscedastic. Bohrnstedt and Carter (1971:142), note, however, "It has been shown that the problems of heteroscedasticity and nonnormality do not, in fact, generally cause serious distortions."

Because this is a longitudinal study in which independent variables are postulated to have effects over time, the dependent variable in 1970 is

similarly lagged in each longitudinal model in order to control for its initial levels. This introduces the problem of autocorrelated error terms; the error term may be correlated with the lagged dependent variable. Examining the residuals for these models, we did not find indications of extensive autocorrelation. However, in order to examine if potential autocorrelation would bias our results, we created an alternative measure of the dependent variable which incorporated the effects of the lagged variable (and thus eliminated the possibility for autocorrelation over time). The dependent variable at 1980 was regressed on its 1970 value. The results of these models closely followed those employing the lagged variables. Thus, we are reasonably certain our results are not an artifact of such autocorrelation. A recent study by Perry (1980) also confronts this problem. He states:

> The panel design may seem questionable because it is susceptible to autocorrelation (Heise, 1970). Autocorrelation is the tendency of error terms to be related which can bias coefficients. To investigate the extent of the bias, Heise performed a series of simulations. He concluded that 'the relative values of the estimates parallel very closely the relative values of the true parameters... Because estimates can be used to assess which relations in a system are of negligible magnitude...a two-wave panel analysis can be used to infer whether there is a causal link from one variable to another' (1970:26). Even with autocorrelation, panel coefficients are useful.

APPENDIX A

MEASURES OF FARM STRUCTURE

Scale

The burification of farm structure should be evident through measures of scale. At the county level, land, sales, and number of farms form the basis for measuring scale. Indicators of scale are: (1) the total number of farms in the county; (2) the proportion of county land in farming; (3) the mean acreage of county farms; (4) the number of small farms, or those with annual sales of less than $2500, in the county; (5) the total dollar value of agricultural product sales in the county; (6) the total dollar value of farm real estate or land and buildings in a county.

Organization

Three types of organizational characteristics of farm structure indicate further aspects of differentiation. These are: ownership, measured by the number of operators in a county who are (7) independent, unincorporated individual and family owners (8) partnerships (9) corporations, including those family held; operation or tenure, measured by the number of operators in a county who are (10) full-owners (11) part-owners, or operators of land they own and also land they rent from others (12) tenant farm operators, who operate only land they rent from others or work on shares for others; labor requirements, considered both in terms of: (a) wage labor, as measured by (16) the number of county farms with any hired workers (17) the number of hired farm workers in the county (18) expenses for contract labor incurred by county farms and (b) capital intensity, as measured by (19) expenses for customwork, machine hire, and rental of machinery and equipment incurred by county farms and (20)

the estimated market value of farm machinery and equipment for all county farms.

Operator Characteristics

In addition to differentiation along the lines of scale and organizational characteristics, the characteristics of individuals engaged in farming may vary by farm type. The measures of operator characteristics are: (13) the number of county operators residing on the farm (14) the mean age of county farm operators (15) the number of operators working 200 or more days off the farm.

While the previous indicators represent a comprehensive coverage of the areas in which farm structural change or differentiation has occurred, there are several limitations due to the nature of the data. First, as previously mentioned, the Agricultural Censuses are limited by the exclusion of certain socioeconomic and particularly noneconomic categories which sociologists find useful. The data provide no information regarding farm household characteristics, such as the demographic characteristics of household members and on and off farm labor contributions of household members other than the operator. In regard to the farm operation, there is no information on the number of hired managers; neither do the 1969 and 1978 Censuses provide information on farm debt. Thus, we are unable to examine several lines along which farming has undergone transformation.

A second limitation is that while most of the indicators are based on information from all farms, the census reported information for six of the indicators in 1969 based only on larger farms, those with sales of $2500 or more. These six indicators were important to this study, however, and hence were retained. In order to ensure comparability, the 1978 data for the large farm base for these indicators were employed as well. Three of the indicators

applied almost entirely to the larger farms for which they were reported, anyway. These were: the total number of hired farm workers in a county, expenses for contract work, and customwork expenses. The other three indicators involved ownership: individual/family ownership, partnerships, and corporations. These indicators would also have the most possibility for distinguishing among larger farms, although individual/family ownership is applicable for small farms. The use of data based on large farms for the six indicators appears to have minimal effect on the measures of farm structure: employing the six indicators calculated on the basis of all farms for the 1982 Census of Agriculture revealed no appreciable differences between these measures and those developed for earlier years (which were based on large farms).

In order to develop the measures of farm structure, the problem of missing data had to be considered. The Census of Agriculture reports data as missing when, for example, data is withheld to avoid disclosure of information for individual farms or when data is unavailable for county farms. There were few missing data on the variables for 1969, the largest number of missing cases on any variable totaling about one percent. In order not to omit the county from the analysis, missing data for 1969 was recoded with the mean value for all counties in the state. State means were considered to more closely approximate the real values for a county than means based upon the entire nation. Several counties also had codes specifying data was close to zero and these were also recoded appropriately. For the 1978 data, however, the problem of missing data was greater. Variables with largest amount of missing data were: contract labor expenses (12 percent); number of hired workers (6 percent); and expenses for custom work (4 percent). All other 1978 variables had less than one

percent missing cases. An examination of the 1978 data revealed that much of the missing data for contract and custom expenses and number of hired workers seemed to result from the avoidance of disclosure for large farms. For these variables, either the mean for all counties in a state or county totals based upon all farms (whichever was smallest) was used to replace the missing values. Other variables with little unavailable data had missing cases recoded to zero, as they seemed to reflect either data inapplicability or values close to zero.

APPENDIX B

MEAN AND STANDARD DEVIATIONS FOR ALL VARIABLES USED IN THE ANALYSIS

Variables	Means	Standard Deviations
Median family income 1980	16688.068	3495.562
Family poverty 1980	.125	.063
Unemployment 1980	.068	.033
Income inequality 1980	.364	.033
% in core employment 1980	.327	.082
% in peripheral employment 1980	.310	.075
% in state employment 1980	.234	.062
Family poverty 1980	.173	.099
Median family income 1970	7450.643	1850.110
Unemployment 1980	.045	.023
Income inequality 1970	.386	.042
% in core employment 1970	.295	.102
% in peripheral employment 1970	.328	.089
% in state employment 1970	.202	.066
Small family farming 1978	50.000	10.000
Large family farming 1978	50.000	10.000
Corporate farming 1978	50.000	10.000
Small family farming 1969	50.000	10.000
Large family farming 1969	50.000	10.000
Corporate farming 1969	50.000	10.000
Establishment size 1977	7.067	3.100
% farm to rural population 1980	.142	.120
% urban population 1980	.354	.286
% black population 1980	.085	.143
Metro adjacency 1980	1.176	.773
Establishment size 1967	6.252	3.556
% farm to rural population 1970	.218	.158
% urban population 1970	.343	.283
% black population 1970	.090	.150
Metro adjacency	1.281	.778

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(beta = .073). Counties with more core employment in 1970 had higher median income in 1980. The other industry variables did not even attain a probability level of less than .0001. For the farm structure variables, larger family farming continues to have its significant positive relationship with median family income; in fact, this beta (.123) is the highest in the model in addition to the dependent lag. Though the negative relationship between extent of corporate farming is low (beta = -.047), it is significant. While the cross-sectional models failed to show a relationship between corporate farming and median family income (and had reversed signs), we find that counties with a greater extent of the corporate farm pattern in 1970 had less possibility for achieving higher income status in 1980. In sum, the effect of corporate farming may be that it works in the historical context to limit future county socioeconomic potentials. Smaller family farming shows little relationship with median family income.

The control variables have somewhat different patterns once the prior effects of median family income are controlled. This is not unexpected because median family income at 1970 is interrelated with all these variables. The percent urban and percent black population become nonsignificant; while metro adjacency, percent rural farm, and percent unemployed, are still significant, but with reduced effects. An interesting reversal in direction takes place in regard to establishment size: counties with larger mean establishment size in 1970 had decreases in median family income in 1980. This is possibly due to the shifting of industrial locations during the decade of the 1970s, whereby highly industrialized counties with larger establishment sizes may have lost previous advantageous employment opportunities. The deindustrialization process (Bluestone and Harrison, 1980) suggests such an explanation.